Sir John Hunter.

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Note Book.

Hardy. 1841.

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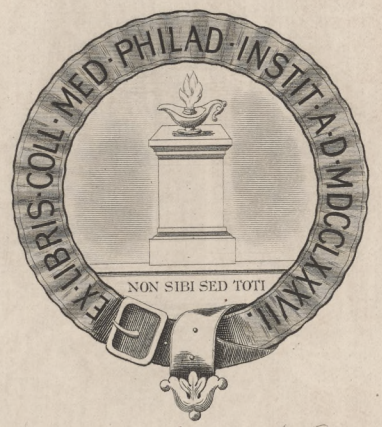

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Presented by

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NOTES

taken from

Hunter on the Blood.

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Of diseased actions, as being incompatible with each other.

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In our ignorance of the essential nature of diseases, the principle here laid down may be considered as to absolutely expressed. Some diseases present many peculiarities scarcely reconcileable upon the doctrines laid down by the author. For an example, Dr. Woodville says, "that if the cow-pox and small-pox matter be both inserted in the arm of a patient, even within an inch of each other, so that on the 9th day the same efflorescence becomes common to both the local affections, nevertheless inoculating from the cow-pox tumour the genuine vaccine disease will be produced; but if the inoculation be performed with a mixture of the two matters, then the chance is equal that small-pox or cow-pox will be be the result, or the varioloid disease, either one of which is capable of conferring an immunity on the patient so affected. Here therefore, are two diseases acknowledged to be distinct and constitutional, not only coexistent in the system at the same time, but (from the blending of the areolar inflammations) apparently in the same part. These cases are however uncommon.

Introduction.

I. Of diseased Actions, as being incompatible with each other.

No two actions can take place in the same constitution, nor in the same part at one and the same time; a disease may be in some specified part and another differing may be in another part, but no person can have (as an instance,) small-pox and the measles at one and the same time, but when a constitution is susceptible of any one disease, this does not hinder it from being also susceptible of others; thus a man may have the measles and when well immediately get the small-pox. 2

II. Of Parts susceptible of particular Diseases.

There are some parts more susceptible of specific diseases than others: thus small-pox, scorbutic eruptions, &c. have the skin; in the hooping cough, and in hydrophobia the throat is the seat of action; the absorbent system especially the glandular part is more susceptible of scrofula than other parts of the body. These differences may arise from the nature of the parts themselves, or from some singular circumstance, which must act as a pre-existing cause.

III. Of Sympathy.

It is divided into 2 kinds: viz. universal and partial; universal is meant where the whole constitution sympathizes with some sensation or action of a part. The universal sympathies are various in different diseases, but those which arise in consequence of local violence, are principally of three kinds: viz. symptomatic, nervous and hectic. The symptomatic fever is an immediate effect of local injury; the nervous has no determined form; the hectic is universal. Partial sympathy may be also divided into three kinds: viz. the remote, contiguous and the continuous. The remote is where there appears to be no visible connection of parts that can account for such effects, such as the pain of the shoul-

der in an inflammation of the liver; the contiguous, is that which appears to have no other connection than arises from the contact of separate parts, such as the stomach and the intestines sympathizing with the integuments of the abdomen, the lungs with the chest, &c.; the continuous, is where there is no interuption of parts, being continued from the irritating point as from a centre, losing itself in the surrounding parts, the spreading of inflammation is an instance.

IV. Of Mortification.

It is of two kinds, one without inflammation, the other preceeded by it. Inflammation is an increased action of that power which a part naturally possesses; and in healthy at least, it is attended with an increase of power, but in inflammations which terminate in mortification, there is no increase of power, but on the contrary a diminution of it. This when joined to an increased action, becomes a cause of mortification, by destroying the ballance which ought to subsist between the power and action of every part.
The treatment of mortification heretofore generally used is absurd; in the common practice the weakness was attended to, but not the increased action.
Many things have been used both internally and locally, which increases the action without giving real strength.
Bark, is the best medicine known, as it increases the powers and lessens the action; Opium is good sometimes, lessening the action but not giving real strength. 7.

Part I.

chapter I.

I. Of the Blood.

Blood is alike in all animals, some however having no red globules. They are not as necessary as is generally supposed.
Blood is called a fluid, because it is always found in a

6 Scarifications and warm dressings are used, as experience and theory both tend to confirm the utility of this mode of treatment, although condemned by John Hunter.

Bark as advantageous in mortification is rated much more moderately than it was formelly.

Of Mortification.

fluid state in the vessels of a living animal while under the influence of the circulation.

The blood has 3 constituents: viz. Serum, Coagulable* lymph and the red globules.

The Serum is the lightest constituent; the red globules which are entangled in the coagulated lymph by their gravity fall slowly to the bottom.

Many causes have been assigned for the coagulation of the lymph, such as, rest, motion, heat, cold, air, vacuum, &c. which appear to be ill founded; rest has great influence on coagulation, but it is not the cause, as blood does not coagulate in priapism.

The separation of blood from the living body, or when it is divided into small portions, becomes one of the immediate causes of coagulation of the lymph; therefore, the contact of blood with blood or with the living vessels, in some degree retards the coagulation; this is the reason why blood which comes slow from the vessels, or falls some height, or runs some distance over a surface coagulates sooner than when the contrary circumstances happen. It is upon this principle that blood shaken in a vial will coagulate sooner (even if shaken in a vacuum) than if at rest. A deep mass of blood is also for the same reason, longer coagulating than a shallow one.

The process by which blood is kept in a fluid state while circulating is supposed to be connected with the living vessels.

Motion is not required to keep up this fluidity.

Coagulation is an opperation of life, proceeding exactly upon the same principle as the union by the first intention; it is particle uniting with particle by the attraction of cohesion, which, in the blood, forms a solid; and it is this coagulum uniting with the surrounding parts, which forms the union by the first intention.

Something more must be sought after: as some inherent property of the blood itself.

The destruction of life by many agents hinder the coagulation, as lightning, fits of many kinds, moral causes, blows on the stomach, &c. By coagulation it is supposed no heat is formed.

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* Coagulable is not an expressive term in this case, as many substances are capable of being coagulated, as albumen, &c. by chemical means, but the coagulation of the lymph is an inherent property; therefore the term coagulating as applied to lymph will be used, while those fluids which require a chemical process to be coagulated, will have the term coagulable applied.

The various constituents of the blood are supposed to be distinct when fluid: thus the separation of serum from the others in dropsy is formed. c (They are now supposed to make a homogeneous mass: viz. the serum and lymph.)

If we tie upon arm, and do not bleed immediately, the first blood that flows from the orifice, or that which has stagnated some time in the veins, will soon separate into its 3 constituents; this circumstance exposes more of the coagulating lymph at the top (which is ignorantly supposed to indicate more inflammation), while the next quantity suspends its red parts in the lymph.

III. Of the Serum.

Serum is lighter than the other parts of the blood.
Some of the juices of a living animal, whether circulating, or lubricating surfaces, are in a volatile state while alive; for when the skin is removed, the part immediately dries, or if a cavity is opened, the surface dries quickly (This shows some part of the juices must have evaporated) but if the animal is dead and cold, there will be no sensible evaporation, even if the body be heated to the temperature of the living body. This volatility is conceived to have a vital cause. See - Serum, at bottom of page 5.

IV. Of the Red Globules.

The red globules do not run into one another when floating in the serum. The property which keeps them separate is not known.
The globules ~~die of the same size in all~~ animals. They are the the heaviest of the materials of the blood. They are not pushed into the extreme arterioles, where we must suppose the coagulating lymph reaches.
Their use seems to be connected with strength.
Some of the muscular parts of the animal system are not so highly coloured as other parts; this is owing to the vessels of those parts, not being sufficiently large enough to allow the passage of the red globules.
Life does not depend on the change of colour of the blood: viz. from venous to arterial, because blood will change colour out of the system as well as in it. The diminution of the hearts motion upon stopping respiration does not depend upon the immediate impression of improper blood on the left auricle and ventricle as a sedative, but upon the sympathetic connection between the heart and lungs; one action ceasing the other ceases; because if the heart was to continue acting, it would send improper blood into the body, by which it can be supported but a little while. The other auricle & ventricle also cease acting for the same reason, although not so soon.

c There is as much reason for believing the fluids in dropsy, &c., are secreted, as there is that they are simply exuded; these fluids differ in composition from the ordinary serum of the blood; effusions of serum never take place without corresponding effusions of lymph, and vice versa.

It has been found that the proportion of fibrin is relatively increased in inflammation. The reason why more buff appears in the first than in the second quantity of blood (a fact by no means universal) will be intelligible from this.
The buffy coat of blood depends on the increased quantity of fibrin, the slowness of coagulation, and the increased tendency to separation acting conjointly.
Blood has generally a greater specific gravity in acute diseases than under ordinary circumstances; but the reverse obtains in debilitating diseases.
Sp. G. 1050 is considered to be about the standard of Blood.
It has been found that cold retards coagulation nearly in the same proportion as heat accelerates it.
The healthy menstrual discharge, which is probably a true secretion, does not coagulate, because it contains no globules or fibrin.

I. Of the Blood.

The chemical relations of albumen are closely allied to those of fibrin; albumen contains less nitrogen than fibrin.
Excessive exercise renders the blood buffy.
Blood spots on linen clothes or steel instruments may be distinguished from any other marks: 1st, by the evolution of ammonia on dry distillation; 2nd, by the effects of acids and neutral salts on solutions of the colouring matters; 3rd, by the usual tests for albumen; and 4th, by blood scaling off from steel instruments on being heated, and leaving them tolerably clean and free from rust.

Of the living principles of the Blood.

The course and circulation of the blood was first discovered by W. Harvey in the year 16
The doctrine of the life of the blood originated with Harvey, but it was erected on a solid basis by John Hunter.
Dr. W. Hunter was the first who showed callus to be endowed with the principle of life, as much as bone.

V. Of the quantity of Blood, and the course of its Circulation.

It is impossible to ascertain the quantity of the blood; it is probably permanent not having one time more ~~another~~ than another help.

The quantity in the animal is proportioned to the uses, which may probably be reckoned 3 in number: viz. 1st simply for the support of the whole, which includes the growth, or increase of parts, the keeping the parts already formed to their necessary standard, and also the supply of waste in the parts; 2nd for the support of action, such as the action of the brain and muscles, in which is produced uncommon waste; and 3rd Secretion.

Blood is the same in all parts of the system.

VI. Of the living Principle of the Blood.

The blood has a vital principle lying in the coagulating lymph. There is a difficulty arising here because we are accustomed to consider a fluid as dead matter; would a dead fluid circulate throughout the animal system and nourish it? One of the proofs that the blood possesses vitality, depends on the circumstances affecting its coagulation. If the blood had not the living principle, it would be in respect to the body an extraneous substance. Blood is not only alive itself, but is the support of life in every part of the body; for mortification follows immediately when the circulation is cut of from any part, which is no more than death taking place in the part from the want of the successive changes of fresh blood. The nerves in which life is supposed to lie makes this seem a little extraordinary; under this idea, it is not clear, whether the blood dies sooner without the body, or the body without the blood. Life, then, is preserved by the compound of the two, therefore an animal is not perfect without blood; but this alone is not sufficient, for the blood itself must be kept alive; because, while it is supporting life in the solids, it is losing its own, or is rendered incapable of supporting that of the body. To accomplish all this it must have motion, and that in a circle, as it is a continuance of the same blood which circulates. Life in some degree, is in proportion to this motion; here then would appear to be 3 parts: viz. body, blood, and motion, the latter preserving the living union between the other two. These 3 make a complete body, out of which arises a living principle

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Serum:- The use of the serum probably is to keep suspended and undissolved the red globules, for we find it in a greater quantity, when the globules are most abundant and also intended to suspend and dissolve any foreign substance in the blood, whether of use to the body, or otherwise, it acting upon the foreign matter as a common solvent.

of self motion: a motion totally spent upon the machine; for the body dies without the motion of the blood upon it; and the blood dies without the motion of the body upon it; perhaps, pretty nearly in equal times.

The fluidity of blood is only necessary for its motion to convey life.

The coagulation is the first step towards its utility in the constitution, and this arises from its vital principle, of which if it be destroyed, it does not coagulate at all. (chemical coagulation is not meant here.)

The coagulation of the lymph is proved to bear some analogy to the action of the muscles, which is known to depend on life, affording one of the strongest proofs of its existence; although the action of coagulation itself be not similar to the actions of muscles, yet, if we can show they are governed by the same laws, we may reasonably conclude that the first principle is the same in both.

Cold is not a cause of the blood coagulating; it may therefore be frozen without its coagulating, but after being thawed it will then coagulate just as soon, as if it had not been frozen. [Leeches have been frozen and yet recovered.]

Animals killed by lightning, blows on the stomach, or by running the animal to death, have not their muscles contracted, nor blood coagulated; this arises from death being instantaneously produced, which therefore will not be effected to contract by a stimulus. In a natural evacuation, viz. menstruation, the blood does not coagulate; this is a species of blood thrown off from the common mass, by an action of the vessels of the uterus, supposed to lose vitality.

The living principle of blood owes its existence to a principle called, the diffused material of life, (Materia vitæ diffusa,) of which every part of the system contains a portion, making necessarily a constituent part of them, and forming with them a perfect whole, giving both the power of preservation, and the susceptibility of impression. This Mat. vit. dif. communicates to the brain (Materia vitæ coascervata,) by the nerves. (chordæ internuncia.)

Every part of the body is susceptible of impression; the Materia vitæ diffusa of a part when thrown into action, which if continued to the brain produces sensation. Nothing however material is conveyed to the brain by the nerves, nor vice versa.

Mere composition of matter does not give life; for the dead body has all the composition it ever had.

Vitality is a property not understood.

Nerves do not themselves, nor from their connection with the brain give vitality to the solids; for a solid still contains vitality after the nerves are destroyed, or when paralytic, the part still continuing to be nourished, although not to the full health of voluntary action; this nourishment is the blood, if the part be deprived of the blood, it mortifies.

It appears evident that the fluidity of blood is only intended

for its motion; and its motion is only to convey life, and living materials to every part of the body. These materials when carried to their destination, become solid; so that solidity is the ultimate end of blood.
The manner in which coagulated blood becomes organized is as follows: blood-vessels either form, (there is reason to believe vessels can be formed by the power of the coagulum,) or shoot into it; the materia v. d. soon opens a communication and forms nerves. Nerves have not the power of forming themselves into longer chords, as vessels are conceived to have. The union of a divided nerve is formed by a coagulum, which gradually becomes of the texture, and of course, the use of the nerve.
It would appear then, that the blood is subservient to 2 purposes in an animal: the one for the support of the matter of the body when formed; the other for the support of the different actions of the body.

VII.

There is not much difference in the time, of decomposition between inflammatory and healthy blood.
The blood of young people keeps sweet longer than that of old people.
Coagulated blood when heated to 98°, grows colder, sooner than fresh fluid blood.
Heat acts as a stimulus on the blood, making it coagulate sooner than cold does, though not more firmly. (This heat is not meant to act on the blood chemically or it would also coagulate the serum.

VIII. Of extraneous matter in the blood.

Whatever is dissolved in the blood must be only diffused through it, not chemically combined with it, otherwise the nature of the blood itself would be altered, and the effect of the dissolved substance destroyed.
The blood can recieve and retain extraneous matter capable of destroying the solids; which is done by the substance stimulating them to action so as to destroy them; it also is capable of altering the chemical properties of the solids, as in those who work in lead, which is evident in the following case: a painter after death being dissected, the muscles appeared as if dipped in a solution of Goulard's Extract.

chapter 2.

Of the Vascular System.

I. General Observations on muscular Contractions and Elasticity.

By muscular contraction, is meant that the fibres shoten, thereby bringing the origin and insertion nearer each other.
A stimulus is not always necessary to cause a muscle to contract; a cessation of an accustomed impulse often causes contraction; as is seen in the sphincter of the iris which contracts when there is to much light, but the radii contract when there is little or no light.
Muscular contraction in some of the involuntary muscles, does not constantly arise from immediate stimuli; as in the sphincters: the sphincter ani contracts whenever the stimulus of relaxation is removed, which may be said to produce the stimulus for contraction.
Muscular actions have been divided into the voluntary, involuntary, and mixed; to these a fourth might be added: viz. where the actions are in consequence of accidental stimuli or impressions; the voluntary and involuntary are subject to this: viz. such as arise from affections of the mind, or are the immediate effects of violence.
The voluntary action is generally under the management of the will.
The involuntary action is most important, and exists independant of the will; as in the muscles* of the circulation of the blood.
The involuntary muscles are stronger than the voluntary; C. g. as is seen in the expulsion of foeces 8 in. in diameter from the Colon of a horse.
Involuntary contraction generally remains longer than voluntary, though not always,
Muscles have the power of contraction and cessation, which last is called relaxation, but they have not the power of elongation, which would be an act of restoration, such as exists in elasticity. A muscle therefore, has the power of action in itself, by which it produces its effects, but it is obliged to other powers for its restoration; whereas elasticity is dependant on other powers to alter the position of its parts, it can then restore itself to its former position.

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*meaning the muscular coats of the arteries, &c.

II. General Observations on the Elongation of relaxed Muscles.

The contraction of a muscle is called its active state.
By contraction, is meant the approaching of the extremities of a muscle to each other.
The contraction and relaxation of a muscle arises from an inherent property, but the recovery, or elongation, must depend on some other power. This elongation, is produced by other muscles, called elongators, or by elasticity, as is the case in the blood vessels.
The elongators are divided into 3 kinds: viz. 1st. Muscular; 2nd. takes place in all muscles which assist in the formation of the blood vessels, and canals; 3rd. takes place by means of elastic substances.
The action of the first kind is reciprocal; for when the muscle is not elongated by the elongator, the elongator itself is elongated.
In the second mode, the muscles if once contracted, cannot be elongated, or the part dilated again, except by the contraction of some other part of the canal propelling its contents into the relaxed parts, E.g. the contraction of the œsophagus pushing the contents into the stomach, the stomach into the duodenum, &c. &c.
In the third kind elasticity is introduced as a contractor, and an elongator the natural position being produced by elasticity, viz. as in blood vessels, &c.
The relaxed state is generally the most natural, but there are exceptions; as in the muscles of the face, the muscles of one side constantly influencing those of the other; the sphincter muscles are generally three-fourths contracted.

III. Of the Structure of the Arteries.

Arteries are endowed with elasticity, and muscular action.
The elasticity varies according according as the distance increases from the heart; it being greatest near the heart, decreasing gradually as it approaches the minute ramifications; the muscularity is the reverse in arrangement, being greatest in the extreme arteries gradually lessening as it approaches the heart.
To prove the muscularity of an artery it is only necessary to compare its action with that of elastic substances: Action in an elastic body can only be produced by a mechanical power; but muscular action acts inherently, more or less according to the stimulus applied.
That arteries possess vitality is evident, for when a living part of one body is placed

in conjunction with another it recieves nourishment and becomes a part of it.

There are 3 states in which an artery is found: viz. the natural pervious state, the stretched, and the contracted which may or maynot be pervious.

The natural pervious state, is that to which the elastic power naturally brings a vessel which has been stretched beyond, or contracted within the extent it held at rest.

The stretched, is produced by the impulse of blood, in consequence of the contraction of the heart; it is brought to its natural pervious state by the elastic power, perhaps assisted by the muscular.

The contracted, arises from the action of the muscular coat; it is again restored by the elasticity.

To show the disproportion in the thickness of the muscular and elastic coats of the different arteries; take a portion of the aorta and a portion of one of the smaller arteries, by looking at the edges, it will be seen that the muscular coat is thin and the elastic thick in the aorta, but the reverse in the smaller artery.

The external coat of an artery, is called the cellular or elastic coat; the middle, muscular; and the internal serous.

The fibres of the elastic coat are transverse, but where a branch goes off, they are exceedingly irregular; the fibres of the muscular are also transverse.

The power of recovery of the blood vessels to their natural state is greater in proportion as it is nearer to the heart; lessening as it becomes more distant from the heart. Therefore the elastic power is greater near the heart, but the muscular power predominates at a distance from the heart.

Arteries do not produce the same power of muscular contraction in a longitudinal, as a transverse direction. The muscular power acts chiefly in a transverse direction; but the elastic power acts greater longitudinally. This appears to be intended to counteract the lengthening effect of the heart, as well as that arising from the action of the muscular coat: for the transverse contraction of that coat lengthens the artery, therefore stretching the elastic, which again contracts upon the diastole of the artery.

Elasticity is better adapted to sustain a force than muscular power: for an elastic body recovers itself again when the stretching action is removed; but muscularity ties to adapt itself to circumstances as they arise. As elastic bodies have a state of rest, and must be acted on before they can react, the use of elasticity in the arterial system is evident. It is by this means, the vessels are adapted to the different motions of the body, as

of the Heart.

The heart in animals of large dimensions is singularly small as compared with the bulk of the whole body, at the same time that its action is remarkably slow. In the fœtus, on the contrary, the heart is proportionably large, and its action in the same degree rapid. It would appear by investigations, that the size of the heart as compared with the whole body decreases in proportion as the animal descends in the zoological scale.

flexion and extension; so that one side of an artery contracts, while the other is elongated, and the canal is always open for the reception of blood, in the curved, stretched, or relaxed state.

The muscular power of an artery renders a smaller force of the heart sufficient for the purposes of the circulation. In confirmation of this fact; it is seen in animals that where the arteries are very muscular, the heart is proportionately weaker.

The arteries are furnished with arteries and veins, which proceed from the neighboring vessels.

V. Of the Heart.

The heart is a hollow muscle which gives the first impulse to the blood.

The valves of the heart are circularly attached, but those of the arteries and veins are obliquely attached. Those of the heart or the circular are more complex than the others; they have tendons to restrain their loose floating edges from inverting themselves into the auricle, upon the contraction of the ventricle. The tendons are generally inserted into the columnæ carneæ; the intention of this is evident, if they had run all the length in the form of tendons, they would have been to long, when the heart contracted; the valves in such a case would be permitted to be pushed into the auricles, but the car. colum. keep the valves in the ventricle, in the contracted state, the dilitation counteracts them placing the valves in their proper situation. If the valves had been placed obliquely along the sides of the ventricle, the attachment would have varied, shortening in the contracted state, & getting longer in the relaxed.

The valves of the right side of the heart do not act as perfectly as those of the left.

The use of the pericardium is probably for the heart to move with more ease and facility. The pericardium contains a greater quantity of fluid than the generality of serous cavities; it may arise from their being greater action on those parts, than takes place in others.

The heart is believed to be proportioned in size to the quantity of blood to be moved and the frequency of stroke it has to make; this is evident in the right ventricle being equal in size to the left.

The strength of the heart is proportioned to the distance the blood is to be propelled; as seen in the difference of the parietes of the left and right ventricle.

The use of this viscus is to give motion to the blood.

The heart performs about half the motion, that it can perform.
It acts with more frequency, under exercise, it contracts with greater velocity; it is also found to make a greater emotion in the chest, striking with its apex against the inside with greater force,* which can only arise from a greater quantity of blood being thrown out, and with greater velocity.
When the body is in action, the blood in the veins is obliged to move with velocity.
It is well known that the times of the repetition of the pulse or actions of the heart increase in many diseases, it differs from the action of exercise in health.

Observations upon the heart's motion, while under the influence of artificial breathing.

I. The auricles contracted very little, so that they did not nearly empty themselves.
II. That the ventricles were not turgid at their diastole; as they felt soft, and could be easily compressed.
III. The ventricles became hard at the time of their systole.
IV. The heart when it ceased to act, became nearly twice as large as when acting; and that it recovered its small size again whenever it began to act.

Observations on the above appearances.— From the 1st, it would seem the auricles are only reservoirs, capable of holding a much larger quantity than is necessary for filling the ventricles at any one time, in order that the ventricles may always have blood ready to fill them.
It would appear from the 4th, that a correct idea cannot be formed respecting the form and size of the heart in dead bodies.
The nearest dependence of the heart is upon the lungs, and probably they have the same on the heart.
Respiration stops before circulation in death.
The pulse is quicker in the younger person than in the older.

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* The reason why the apex of the heart strikes against the chest in its actions, was first accounted for by Dr. Wm. Hunter in 1746. The systole and diastole simply could not produce such an effect; nor could it have been produced if it had thrown the blood into a straight tube, in the direction of the axis of the axis of the left ventricle, as is the case with the ventricles of fish, and some other classes of animals; but by its throwing the blood into a curved tube, viz., the aorta, that artery at its curve endeavours to throw itself into a straight line to increase its capacity; but the aorta being the fixed point against the back, and the heart in some degree loose or pendulous, the influence of its own action is thrown upon itself, and it is tilted forwards against the inside of the chest. [This explanation is correct as far

VI. General Observations on Blood-vessels.

Every part of the body is subservient to the vascular system.
The arteries are to be considered as the acting part of the vascular system.
The extremities of arteries may be divided into 3 kinds, viz., one carrying debilitated blood into the veins; another separating the different secretory substances, performing secretion; and a third forms and supports the body.
It is probable that every part of the body is equally vascular, although the same quantities of blood are not distributed through them, which must arise from the smallness of the vessels, and not from their being fewer in number. When a part is said to be very vascular it is meant visibly so, having a large vessel or vessels going to it, rendered visible by the red blood in them.
If the muscles are not exercised they become pale, owing to the vessels not dilating enough to carry red blood; they dilate in exercise. Some animals have naturally red muscles, with its being the effect of action, as in the hare; it may be intended to adapt the muscles to violent exertions. Muscles differ in colour, in the same animal, owing to the proportion of action in the part. The change of appearence carried on in the uterus at the time of the menses is a proof of this; greater at the time of utero-gestation, where the vessels increase both in size and length in proportion to the action required.
Parts that are passive need but little, such as tendon, ligament, &c. As a further proof that this is a general principle, all growing parts are found much more vascular than those arrived at their full growth.
Parts become vascular in inflammation.
The vascularity in a part, and also the circulation of the blood through them, appear to keep pace with its sensibility. As a proof of the foregoing; increased action, circulation, and sensibility in coitus.
Vessels have a power of increase in themselves both in diameter and length, which is according to the necessity, whether natural or diseased. Proofs.- natural: increase of the body; diseased enlargement of the vessels upon irritation.
The arteries often perform diseased operations in the body, which become symptoms both of local and constitutional actions, as in inflammation, fever, &c., for they are not only active in local disease, but their action often becomes a symptom of a constitutional disease, whether original, or arising from a local cause; but these symptoms become

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as it goes; but the cause assigned is not the only one why the apex of the heart strikes against the ribs at the moment of its contraction. The direction of the mass of its fibres is also concerned, which tends to tilt the apex forward, as may be clearly proved by placing the heart of an animal in a state of action on a plane surface, when it will be found that the apex moves forwards, although the base is comparatively stationary.]

mostly sensible to us in those arteries whose actions we can feel, because they have a peculiar action in their diastole, as well as in their systole, which is sensible to the touch; from which sensation, in many cases, we judge of the state of the body at the time; as also the state of the cause when local, and out of sight. The heart is also affected, so that its motions correspond generally with those of the arteries.

VII. Of the Valves of the Arteries.

They are inelastic.
Blood sufficient to keep the animal alive, is sufficient to distend the arterys so as to close the valves.

VIII. Of the Division, or branching of Arteries.

Arteries generally branch off in acute angles; the branching in this way being more favourable to the passage of the blood, more especially in those which are to carry the blood some distance; and still more so as the distance increases from the heart: those near the heart we find come off in obtuse angles, but as the distance increases they become less and less till quite acute.
Arteries divide and subdivide more quickly in some places, than in others, for instance they divide in the glandular system immediately on entering, seeming as if they were hurrying to their destination.
Arteries generally pass in as direct lines as possible.
The anastomosing of vessels is useful in preventing the stoppage of the circulation. In the small vessels the anastomosing is most frequent; but in some parts which are liable to pressure, large trunks anastomose, as the hand, &c. The intestines is a beautiful example of this, being liable in foecal circulation of pressing upon the vessels of the mesentery, large and frequent anastomoses exist. There is no anastomosing of vessels in the substance of the brain. The pia mater however is full of anastomosing vessels.
The arteries of the kidneys, of the villous coat of the intestines, and also the vena portarum do not anastomose. Anastomosis retards the circulation: as proof no anastomosis is found in the arteries of lungs, kidneys and in the liver, except in the peritoneal coat. The anastomosing increases the volume, therefore containing a greater volume of blood. Arteries keep a pretty exact proportion, in capacity with each other: the branches with the trunk throughout the whole system.

The arterial system forms a cone, the apex of which, is at the heart. A child is more vascular than an adult in proportion to its size. There are many strong proofs that many arteries are obliterated in the adult. From this it appears the arteries are only elongated instead of new ones being formed.

It should not be forgotten, however, that there are other parts which become developed and require a larger supply of blood in the adult. The muscular system is an instance, which can scarcely be supposed to contain an equal number of capillary vessels in the infant as the adult. Some organs also, as the genital, must surely have a larger supply of vessels in the adult than in the infant.

An artery not giving off branches, does not increase as fast as one which does, if we include all the branches.

Arteries never communicate directly with the veins, but always through a vascular network, in all warm blooded animals, in which the systems of dark and scarlet blood are preserved distinct. In the inferior animals and even in the embryos of warm blooded animals such communications exist, because in these instances it is not of the same importance to keep the systems apart. The term capillary therefore ought exclusively to be applied to this intermediate system of vessels, which appears essentially to differ both in function and distribution from any other parts of the vascular system.

IX. Of the action of the Arteries, and the velocity of the Blood's Motion.

ГОСУДАРСТВЕННАЯ ПУБЛИЧНАЯ БИБЛИОТЕКА

of certain plants. Insoluble in water & alcohol; soluble in ether & various volatile oils.

Of certain proximate principles of animals.

Albumen. It is found in two distinct forms; soluble & insoluble: soluble in serum & the albumen ovi; insoluble in nervous matter, &c. Soluble a liquid albumen – is coagulated & rendered insoluble by heat,* alcohol, certain salts, &c.
It unites with certain salts, particularly bichloride of mercury & the salts of copper, forming with them insoluble compounds.
If too much albumen be used, the precipitates are redissolved.

Gelatin. It contained in the skin & membranes of animals. It forms the swimming bladder of fishes almost exclusively. Gelatin is insoluble in cold water, but is soluble in hot water with which it forms a jelly. When the jelly is dried it forms a hybrate of gelatin & then resembles glue. It precipitates tannin.
Ichthyocolla is a variety of gelatin. Considerable quantities are prepared for the swimming bladder & sounds of the sturgeon, in Russia. There are 3 varieties; the staple, the book or leaf, & the cake isinglass. In this country much is found, also from the same parts, as above, but also from the intestines & peritoneum of fish.
The finest variety makes a good jelly, dr. iij to Oj Water, with a little wine, nutmeg, &c.
Ichthyocolla is used to clarify liquors, &c., &c..

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* The length of time to boil an egg properly, is, 3 minutes. & it has lately been asserted that 36 minutes is the proper time. Ed. W.

yellow fragments.

Copal is derived from various species of Hymenæa, &c. It is composed of 5 distinct resins. It is from the East Indies, South America, Africa, &c.

Elemi is a concrete juice. Source unknown. From S. America.

Lac. Origin is singular. It is produced by the puncture of insects in certain plants, the juice exuding & enfolding the insect. It is from the E. Indies. There are 3 varieties: seed lac, shellac, & stick-lac. It contains coloring matter, &c.

Mastic. Derived from a species of Pentaceus. From the Grecian Archipelago. It is in yellowish tears. It has been used to fill carious teeth.

Sandarac. From the North of Africa.

Sanguinis Draconis. West Indies.

Balsams consist of resins with benzoic acid & volatile oil.

Vegitable Albumen. This principle is found in many seeds. As it exists in them it is soluble, however, it is insoluble in some of them, being coagulated. It is insoluble in alcohol, being coagulated, as in also the case by heat. It forms an insoluble compound with the bichloride of mercury. It consists of C.O.H.N.

Gluten. Is very analogous to the animal fibrine. It is soluble in boiling alcohol; insoluble in water, cold alcohol & ether. When moist, & exposed decomposition takes place, emitting an offensive odour like putrefying animal matter.

Extractive Matter. A name applied to various principles; of course it differs from ordinary extracts. Soluble in water & alcohol. Its solution on exposure absorbs Oxygen, which renders it insoluble in alcohol.

Caoutchouc. Found in various milky juices

solid. They will not form salts with alkalies. The ultimate analysis of them, is, generally, C.O.H; some when pure consist only of C. & H, but on exposure they absorb O. By the absorption of O. they form resins, which may be dissolved in the other portion of the oil. Some contain a little sulphur, &c.

Volatile oils consist of 2 distinct portions, one being more consistent than the other, at the same temperature: elaoptene which is fluid, & stearoptene which is solid; sometimes there are more than these 2 ingredients.

Volatile oils, generally, are isomeric, differing only in the arrangement of their particles.

5. Resins.— A term applied to certain concrete ~~& liquid~~ juices, which have peculiar properties. Some of them have 5 a 6 distinct principles.

General properties— Solid or semifluid, transparent or transparent; when pure, nearly colorless or yellow; brittle when cold, when the temperature is elevated they become tenacious; at a higher temperature they melt; at a higher, in a close vessel, they are decomposed; if with access of air, they take fire & burn with a good deal of smoke. Shining fracture; inodorous & tasteless when pure. All of them are insoluble in water; generally soluble in alcohol; all in hot alcohol & ether. By being dissolved in solution of alkalies, they form soaps, the results of which, are species of soap. Some liquid resins are rendered solid by alkaline earths. Resins act the part of acids.

In various resins, there is a mixture of a number of distinct resins. They are principally separated, by the different solubilities, &c. some being soluble in cold alcohol, others in hot, &c.

Most of the resins, in plants, probably become so, from the absorption of O. by the volatile oils.

Common Rosin a resin— Obtained from the various species of the Pines, &c.

Anime— Source unknown. Obtained from Mexico. It is in small

has a rough appearance; odour peculiar. It is purified & bleached, by melting it, & pouring it upon a revolving cylinder; by this treatment it is brought to the state of ribbons; it is then exposed to the influence of the light & air: oxygen combines with the colouring matter, & it becomes perfectly white & harder & firmer than the common kind. The pure wax is inodorous & tasteless. Wax is decomposed by a high heat. It is insoluble in water & cold alcohol; a part of it, called cerin is soluble in boiling alcohol; the other part, called myricin is insoluble. Wax forms soaps with the alkalies, &c. Acids do not act upon it. It unites very readily with fatty matter & oils.
In cerat. simplex, wax is the predominant ingredient, 2 of wax & 1 of lard.
In Ung. simplex lard predominates - 2 of lard & 1 of wax.
Vegetable wax. In this country it is chiefly obtained from the berry of the wax myrtle. It has a greenish colour, &c. It is more unctuous & brittle than beeswax. It is chiefly used in making taper.

3. Spermaceti. From the cavities of the head of a certain kind of whale, with oil, &c. It fuses at 112°. Soluble in boiling alcohol & ether; this deposits on cooling a peculiar substance called cetin. It is used for the formation of unguents.

4. Volatile Oils. Abundant in nature; they constitute the odorous principles of most plants which have odour. They are the active principles of almost all the aromatics. They are usually liquid, sometimes solid, of various colours, have peculiar strong odours. They are usually lighter than water, some are heavier, & some have the same Sp. Gr. They are sparingly soluble in water; but are readily soluble in alcohol & ether as a general rule. They are very volatile; they boil at 300°, & they have considerable affinity for watery vapour, the substances employed to obtain the oils, are distilled with water, so that the oils go over with the watery vapour into the receiver. They all undergo volatilization or evaporation; when in any quantity a portion absorbs oxygen & becomes

dles, which resemble those of wax.
Suet is preferred in making certain ointments, to lard, when they are wished to be very consistent.
One of the most important properties of fixed oils, is, that by the reaction of alkalies they form soluble salts, called soaps. Water is essential to the union between the oils & alkalies. By the reaction of water with the presence of an alkali, ~~upon~~ oils, a substance called glycerine is given out, while the fat acid combines with the alkali to form soaps. The glycerine is dissolved in the water & may be separated. From vegitable oils, we have oleo-margarates; from animal oils, oleo-stearates of soda or potash as the case may be. The alkaline earths, earths proper & metallic oxides form soaps, but they are insoluble.
Potash soap ~~is soft~~; while soda soap is hard.
There are 2 varieties of soda soap, viz. that formed from animal & that from vegitable oils. = The common soap is an animal soda soap. Almond oil forms a very inelegant soap. Olive oil forms the castile soap: the white & the marbled; the marbling is produced by irregularly mingling Ox. iron.
Both varieties are used in pharmacy. Vegitable soda soap is used for the Tinct. Sap. Camph.; Animal soda soap for the Linimentum Sap. Camp..
Incompatibles — Mineral acids, earths, metallic oxides, many salts, &c.
The hardness, as it is called, of certain waters is owing, to their holding some earth, or oxide, &c. in solution.
To the lead plaster; the oleo-margaric acid, combines with the lead forming a salt; the glycerine is kneaded out.
All fixed oils are more or less laxative.

2. Wax. Cera.

Is very similar to the fixed oils. It is found in many plants; it gives the glaucous bloom to ~~various~~ parts of many plants. The greater proportion is the product of the bee, being a secretion of that insect.
Common bees-wax — Is yellow, solid; fusing at a low temperature; when cut it exhibits, what has been called the waxen lustre; when broken it

are carbonic acid & water. When heated in an iron retort without access of air we have various gases resulting from the decomposition, chiefly compounds of carbon & hydrogen.

The fixed oils are lighter than water, & consequently float upon it; if the water be rendered tenacious by gum & then shaken with the oil, the oil will be suspended, forming an emulsion. These emulsions have a milky appearance, the oil very gradually separates from the mucilage. Albumen has the same property, of suspending oils in water. This emulsion with albumen oil have frequently in many fruits, as the almond, &c. They are more or less soluble in alcohol, soluble in ether. When exposed to the air, they absorb oxygen, give out carbonic acid & become solid: some dry like resins, such are called drying oils; others harden like tallow, & are called fat oils. The fixed oils are not strictly proximate vegetable principles, but are composed of 2 or more of such principles. Every one has 2 distinct principles: 1, liquid at ordinary temperatures, the 2, solid; the former is called oleine or oleic acid, the latter has various names, that from vegetable oils, is called margarin or margaric acid; that from animals oils, which have exactly the same properties as the vegetable, is called stearine or stearic acid. These principles may be separated to a certain extent by pressure; the liquid oleine being pressed out while the stearine or margarin remains. They may be more effectually separated by boiling alcohol which dissolves the whole, but on cooling it deposits the solid stearine or margarin, retaining the oleine; by pouring the alcohol off & evaporating the oleine may be obtained.

Stearine differs from margarin in not being soluble in ether; they are both soluble in hot ether.

Animals oils are usually more consistent than vegetable oils; many of them are solid. Lard, adipo; suet, sevum; &c. See Dispensatory.

For medical use these fats should be perfectly sweet & free from salt.

Lard oil - is the oleine of lard; the stearine is used to make cam

Sugar of grapes solidifies from the liquid containing it in small white granules. It has a sweet taste, but less so than sugar, being 2/3 per ct. less. It produces a sense of coolness upon the tongue. It is less soluble than common sugar. Slightly soluble in alcohol

4. Sugar of Mushrooms – seldom met with.

Honey cannot be strictly considered as of vegetable origin. It is soluble in water. It consists of 2 portions: a uncrystallizable sugar & the sugar of grapes. When both are in solution in water, alcohol will dissolve the uncrystallizable portion leaving the sugar of grapes. Honey may be used as a substitute for sugar. It is more laxative than sugar. It disagrees with some stomachs. A solution in water, on exposure, undergoes the vinous fermentation, giving rise to methyglin or mead.

To have the vinous fermentation, a certain temperature & the presence of a ferment are necessary. By this process sugar is converted into carbonic acid & alcohol. Fermentation is a state of decomposition.

Sugars are first converted into sugar of grapes, in fermentation, & then into alcohol, &c.

V. Lignin – Woody fibre; it forms the basis of almost all plants. It is insoluble. By the action of sulph. acid it is converted into the sugar of grapes & dextrine.

2 sub. Substances in which Hydrogen & Oxygen are not contained in sufficient quantity to form water.

I. Oils. The only common property which they have is the unctuous feel & appearance called oily.

There are 2 distinct sets, the fixed & the volatile.

Fixed oils are either liquid, or easily rendered so by heat. They are found in many plants, most abundantly for the seeds or fruits, from which they are generally obtained. They are generally obtained by expression. They are called fixed, because they are not volatile without decomposition.

Tardarous & tasteless when pure; generally of a yellowish colour*; insoluble in water. At 600° F. they are volatilized, at the same being decomposed. The results of

* colourless when pure.

Dispensatory. p. 584. In Europe sugar is obtained very largely from the beet; France & Germany are nearly supplied with it. A considerable quantity is obtained from the sugar maple (Acer saccharinum) in the United States.

~~The solution of sugar is~~ evaporated, so as to harden on cooling, big poured on an oiled surface, & rolled into sticks, forms the barley sugar.

Sugar melts by heat, which when increased decomposes it, emitting at the same time, a peculiar, not unpleasant odour. It is very soluble in water; it is also soluble in common alcohol, very slightly in absolute alcohol. A saturated solution of sugar is called syrup & is permanent on exposure, but a weak solution is decomposed on exposure.

When an acid is added to sugar, at the boiling temperature, it is converted into uncrystallizable sugar, next into sugar of grapes, & ultimately into oxalic acid. The acid added to the sugar does not undergo change itself; it should be diluted.

The chemical relations of sugar are not very extensive; it therefore may be given in almost any medicinal preparation. It, however, decomposes certain metallic salts when boiled with them.

In pharmacy sugar is used to suspend insoluble substances in water, to give consistence to the pillular mass, &c. It is much used to preserve vegetable substances, forming conserves, &c.

Impure sugar is laxative. Moderately taken it is wholesome, but if immoderately used, it interferes with the digestive functions, &c.

A solution of gum & sugar evaporated, forms the gum pectoral; this dissolved slowly in the mouth is used in catarrh, &c.

2. Molasses, or Uncrystallizable Sugar. This will result from the long boiling of pure sugar; if it be boiled for a long time, water being added as it evaporates, the whole will be converted into molasses. Sugar house molasses is purer than plantation molasses; the latter is a useful laxative in constipation, the digestive powers being good.

3. Sugar of grapes — found abundantly in old raisins, & in nearly all sweet fruits.

By the action of sulphuric acid upon gum, or starch, lignin, &c. they are converted into dextrine & the sugar of grapes. Common sugar is converted into the sugar of grapes, by the juices of many fruits, as seen in our preserves.

4. Arrow-root - product of Maranta arundinacea. It is prepared from the root. The plant grows in the E & W. Indies, &c. particularly cultivated in Bermuda. Potatoe starch when prepared with care, so as to destroy the flavour of the potatoe, will answer very well as a substitute for arrow root.
A variety has been lately brought from the South Sea Islands; being obtained from a species of Tacca. Another from the W. Indies, called Tou la moi. It is very beautiful, & is obtained from the root of a species of Canna; another variety brought recently from Florida as the product of the root of the Zamia integrifolia.

IIII. Pectin. Formerly called vegitable jelly. It is found in the juices of various fruits, as currants, gooseberries, &c, combined with water which when sufficiently evaporated, the pectin coagulates. It may be separated from its solution by the addition of alcohol, which taking the water precipitates the pectin. It is insipid, & when added to water it swells like bargum. Another characteristic which it possesses, besides that of forming jellies, is its performing the office of an acid, combining with alkalies, forming pectates. It closely resembles gum, but differs, in gum not coagulating, & also in not acting the part of an acid.

IV. Sugar. The term is restricted to those principles having a sweet taste, & being capable of undergoing the vinous fermentation, & thus converted into alcohol. There are principles which have a sweet taste, but have not the latter property, as mannite, glycyrrhizin, &c. There are 4 kinds of sugar, viz: 1st the common crystallizable sugar, 2nd the uncrystallizable sugar, 3rd sugar of grapes, & 4th sugar of mushrooms.

1. The sugar generally used, is derived from the sugar cane, sugar maple, beet, & latterly it has been obtained from the common corn stalk.
It is chiefly derived from the sugar cane (Saccharum officinale) There are 2 varieties, 1 from the E. Indies, the other from the South Sea Islands; the latter is the larger, & is called the otaheite sugar cane; both varieties are cultivated in different parts of the world.
For an account of the process, by which sugar is obtained from the sugar cane, its purification, &c. See Wood & Bache's

quantity of pillicles is small, not more than 4 or 5 parts in a thousand. Another peculiarity of starch, is, its convertibility by a peculiar principle, called diastase*, into dextrin⊙ & afterwards, converting the dextrin into sugar resembling that of grapes. Diastase is produced naturally during the process of germination: it is one of the 1st products of germination, by its acting upon the starch, it is rendered soluble, so that the vessels of the newly formed plant may easily take it up. The conversion of grain into malt, is a partial germination, by which diastase is produced, which subsequently acting upon the starch, converts it into sugar, which by vinous fermentation is converted into alcohol, &c.

Diastase is soluble in ~~[illegible]~~ weak alcohol; it may be separated from the substance which contains it. In what way it converts starch into sugar, is not exactly known. It may probably act as a sort of ferment, converting the starch into another principle & it does not combine with the starch, nor does it take any of it, but merely converts it into another substance. According to Liebig, decomposition in the diastase, which is in contact with the starch, causes a like movement to take place in the starch.

Varieties. 1. Common starch, from wheat, or potatoes. The solution often used as a vehicle for other medicines, in injection, as when you wish laudanum to remain in starch, &c.

2. Sago, product of Sagus Rumphii, for East Indies, also from various species of the natural family Cycadiae, as Cycas circinalis. The chinese of Singapore, &c. prepare a finer variety from the coarser. Where pure consists of nearly pure starch. It must be boiled a long time to dissolve it wholly.

Each particular variety of starch has a peculiar shaped granule.

3. Tapioca. From the Cassava, Jatropha Manihot. Grows in W. Indies, Brazil, &c. Obtained from the root, which is tuberous. There are 2 varieties the sweet & bitter. The bitter variety contains an acid poisonous juice when fresh, it is volatile. The last variety is the more cultivated of the two. When the starch is prepared, the acid principle is expelled by heat. This principle is said to be hydrocyanic acid. When the plant grows, the root is much used for bread by the natives.

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* A peculiar principle discovered in seeds, &c. after germination. ⊙ A substance resembling gum in appearance & properties, but differing in not forming mucic acid by the action of nitric acid.

III. Starch.— Is an abundant principle in plants, & perhaps is inferior to none in quantity. It is particularly found in the roots, especially the tuberous; & in seeds, especially those of the grapes. For use it is chiefly obtained from tuberous roots & seeds, &c. Starch is prepared, generally, by bruising or comminuting the substance from which it is to be obtained, in water, by agitation, the gummy matter is dissolved, while the starch is merely mixed with the water; the water being poured off, the starch is allowed to subside, when the water is poured off & the starch dried. When dried in a mass, it has a tendency to break in hexagonal pieces, not crystalline however. General properties. Starch is white; inodorous & tasteless. It is insoluble in cold water, alcohol, & in ether; soluble in hot water. The most interesting chemical relations, are, that it forms an insoluble compound with the oxide of lead, & is consequently precipitated by a solution of the sub acetate of lead; an insoluble compound with tannic acid; also with iodine: forming a dark compound, varying from blue to black, it is hence, used as a test for iodine, & vice versa. It will serve as a test even if the starch be exceedingly diluted or even if merely mixed with cold water. Starch is dissolved in alkaline solutions (combining with the alkali) from which it may be precipitated by an acid.

Starch when boiled in dilute sulphuric acid, is converted into a sugar resembling that of grapes. It is entirely decomposed by strong sulphuric acid. It is composed of nearly the same proportions of the elements of sugar, as sugar itself. Nitric acid converts it into Oxalic & malic acids.

When starch is heated, or rubbed in a mortar, it is rendered soluble in cold water. The reason of this is explained as follows; It is found by microscopical examination, that starch consists of numerous granules; each granule having an interior substance, which is soluble in water, either cold or hot, & an exterior pellicle, which is insoluble in water, hot or cold; by heat the pellicle is ruptured, & the water gains access to the interior substance which is soluble. By examination, it will be found that the pellicles subside to the bottom of the vessel, when starch is dissolved in hot water. The

are translucent, or nearly so; nearly tasteless; nearly inodorous, & which are nearly all soluble in water, or are capable of combining with it to form a viscid paste. Gum is converted by the action of Nitric acid, into a peculiar acid, called Mucic acid.

Gum is not strictly a proximate principle, but is composed of several; 3 distinct proximate principles, viz. Arabin, Cerasin, & Bassorin.

1st Arabin, often called "pure gum". It is found in nearly a pure state, in the purest gum Arabic. Arabin is transparent & brittle, having a vitreous fracture; it softens by heat but does not melt; it dissolves in either hot or cold water, forming what is called mucilage. It is insoluble in alcohol. Arabin enters into combination with various substances; one is the oxide of lead in the sub acetate of lead, forming with it, an insoluble precipitate, hence it is incompatible, but it is not incompatible with the acetate of lead.

The solution of arabin keeps well in a vacuum, but it soon decomposes on exposure, giving rise to acetic acid, & Arabin is a constituent of vegitables, which is very widely diffused throughout nature.

2nd Cerasin, named from Cerasus, (cherry.) Cherry gum is an example of cerasin. It is reddish brown, & has all the general properties of Gum. It differs from Arabin in not dissolving in cold water, but it combines with it forming an adhesive mass. If boiled it is converted into arabin, by some change in its particles, & will be rendered soluble; chemically speaking, it is isomorphous with arabin.

3rd Bassorin, found in Gum Bassorin, also in Tragacanth. It is insoluble in cold water, but unites with it, slowly enormously, & forming a very viscid paste. It is not converted into arabin by boiling, but will be so if a small portion of mineral acid be added. Gum Tragacanth is the base of trochs, &c. Besides containing Bassorin, it contains some arabin which is dissolved out in water. For further account of particular Gums, See Wood's D.

They are nearly all solid, some however, are liquid. When pure they are white; some crystallizable, others are not; inodorous; the taste of all, is bitter or acrid. They nearly all produce a decided influence upon the system.
They are generally of difficult solubility in water, but the salts formed from them are generally very readily soluble. Most all of them are soluble in hot alcohol, but generally are precipitated upon cooling. Some of them are soluble in ether: in this way one of them may be separated from another, as is the case, by dipolizing morphia from morphia, &c.
They all neutralize the acids, & form salts; which, as before mentioned are nearly all soluble in water, but a cold, viz. with Sulph: Muriat: Nit: or Acetic acids.
These salts are decomposed by the mineral alkalies, but if an excess of potassa or soda be used, the compound formed, is redissolved. Some acids form salts of difficult solubility with them, as oxalic, tartaric, or tannic acid, therefore tannates, gallates, or tartrates of the alkalies are incompatible. Tannic acid forms insoluble compounds with all of them, but the resulting compound, is soluble in alcohol, or in an excess of some vegitable acid, as acetic, &c.
They consist of Carbon, Oxygen, Hydrogen & Nitrogen, the nitrogen bearing a definite proportion to all of them.
Their combining numbers are very high. When exposed to a high degree of heat, they are decomposed, & if pure will be wholly dissipated, hence, may test their purity by exposing a portion to heat.

3. Class. Neutral Substances.

There are two distinct sets of them: 1st those consisting of Carbon, Oxygen & Hydrogen, the Oxygen & Hydrogen being in the proportion to form water; and 2nd those consisting of carbon & Hydrogen, & often oxygen, but it is insufficient to saturate the Hydrogen so as to form water.

1st Ord. I. Gum. — This name was formerly applied to any inspissated juice of plants, but at present, the name is confined to those vegitable principles, or solid juices, which

There are some other acids, but they are of little importance, as, the kinic, meconic, igasuric, &c.

2. Class. Vegitable, or Organic Alkalies.

They possess no other alkaline properties, excepting that of neutralizing acids. They have been called by Thenard, & very properly, "organic salifiable bases." Their discovery is of comparatively recent origin. They are chiefly named from the substance from which they are derived, or from some peculiar medical property which they possess. The French chemists terminate them in, "ine", but the English & American chemists, use the termination "a, a ia", to distinguish them from other vegitable principles which are not alkaline, & which terminate in or, "in or ine", as colombine, colocynthin, quassin, &c. These veg. alkaloids are always found in combination with something else in the plant; generally with a vegitable acid, which is often peculiar, as meconic acid combined with morphia, in Opium, &c. As thus existing in the plants, they are generally comparatively soluble in water, & hence plants containing them, generally impart them readily to water.

The manner in which they are generally obtained from the plants, is, as follows: The plant being submitted to a solvent, which is generally water, the solution is filtered. The vegitable salt which contains the alkaloid, is now decomposed by some mineral alkali, which takes the vegitable acid, while the vegitable alkali, which is comparatively insoluble, is precipitated. Ammonia & magnesia are the ones generally employed, because if an excess of potassa or soda be used, the precipitate will be redissolved. The precipitate is gathered, & is separated from impurities by boiling in alcohol & filtering, & as the alkalies are generally soluble in hot & not in cold alcohol, on cooling, the v. alkali crystallizes; but if the alkali be soluble in cold alcohol; the alcohol is evaporated of heat, to purify them still further, they are redissolved in boiling alcohol, with animal charcoal, filtered, & set aside to crystallize, or to be evaporated, as the case may be; or a salt is formed with some acid, which being soluble in water, it is dissolved in that fluid, & set aside to crystallize, &c. while the impurities remain behind.

VII. Lactic acid. It is produced by the spontaneous decomposition of milk. It is found in various animal fluids, & also in some plants. It is obtained for use from milk, the sour solution of which, after decomposition, is it. It may be evaporated down to a syrupy consistence, but if increased it will be decomposed.

VIII. Acetic acid. It is the result of acetous fermentation. It exists in many plants. It is obtained by exposing saccharine liquids, with a ferment, to moderate heat & access of air: an intestine action takes place, decomposition & a complete change of the materials employed; this is called the vinous fermentation: the sugar is changed into alcohol, if the alcohol is in large proportion, it preserves the liquid from further change, but if the quantity be rather small, & it be exposed to warmth & air, a new fermentation, intestine action, decomposition, &c. takes place; this is called the acetous fermentation, by it the alcohol is changed into vinegar, as when weak wines, or cider is employed. Starch may be used, in this process the starch is first, converted into sugar, &c. in this way good vinegar is made from potatoes, which contain a considerable quantity of starch. The ~~Acetic acid thus~~ obtained, are far from being pure; they contain a large quantity of water, mucilage, &c. To obtain the acetic acid pure, with the exception of the water still remaining with it, it is subjected to distillation. It is obtained pure by decomposing the soluble acetates with a mineral acid, as in the process of the U.S. Pharmacopeia, It contains ½ water.* ~~It is purified by distilled vinegar, which is of a specific strength~~. It has a strong, fragrant, pungent odour; is very volatile. It is refrigerant when evaporation is aided, but when suppressed it is rubefacient, &c. It has lately been used, concentrated, as an external irritant. The way to ascertain its strength is to see its combination with bases. It is often adulterated with Sulph: acid, it may be detected by adding lime water.

*. By adding 10 parts of water, it will be as strong as the distilled vinegar, & is superior in possessing a precise, known strength.

it is perfectly white, but it generally has a yellowish tinge. It is inodorous; the taste, is purely astringent. It is soluble in water, slightly soluble in alcohol & ether. The solution (watery) on exposure is decomposed: oxygen is absorbed, carbonic acid given off, & a crystalline compound is deposited, which is gallic acid. Incompatibles. It forms insoluble compounds with most of the alkalies, especially potassa & ammonia; with soda the compound is comparatively soluble. An insoluble precipitate formed with lime-water. It combines with almost all of the metallic salts, as, the soluble salts of lead & antimony, tart: emetic; Sulph: cupri; per salts of iron; (the prot-salts of iron on exposure, soon become persalts.) &c. It forms comparatively insoluble compounds with the vegitable alkaloids & their salts, the precipitates, however, are soluble in alcohol, or in an excess of vegitable acid. It is incompatible with some of the mineral acids as Sulph: acid & Muriatic acid, not so much so with Nitric acid. It forms insoluble compounds, also, with some ingredients of plants, as starch, &c. also animal, as gelatin.

There are 2 varieties of tannin: 1. producing blue black precipitates with the persalts of Iron, as galls, oak bark, &c, another producing a greenish black precipitate with the persalts of iron, as the tannin in red & brown substances, as kino, catechu, &c.

The varieties of tannin are generally named from the substance from which it is obtained, as catechu tannin, &c.

The infusions of cinchona, or oak bark produce a precipitate with tart: emetic; the infusions of catechu or kino, do not. Some varieties on exposure are converted into gallic acid; others into a brown compound, called by Berzelius apothème.

VI. Gallic Acid. A frequent accompaniment of tannin. It is but slightly astringent, & sour. Tannic acid on exposure in solution becomes converted into gallic acid, & as it is found in many plants, it may probably be formed from the tannin, by the exposure to the weather. It is very soluble in hot water, but is comparatively insoluble in cold water. It forms gallates, with the same substances, with which tannic acid forms tannates, excepting gelatin.

tain tartaric acid, a solution of carb: of potash; if it contain the tartaric acid a white precipitate, the bitartrate of potash will be formed, if the citric acid be pure no precipitate will be formed.
For medical properties See Wood's Syllabus.

IV. Benzoic acid.— Obtained from substances called balsams; generally from the Benzoic balsam. It is obtained from it by sublimation.
The taste is not very sour, its odour is owing to some volatile oil. Fusible by heat, & may be sublimed unchanged. It is slightly soluble in water, soluble in alcohol.

Benzoic acid has the power of converting the insoluble uric acid, (found in persons of a gouty or calculus diathesis deposited in joints, bladder, &c.) into a hypuric acid which is soluble; hence, it may be used in those cases where there is a tendency to the deposition of uric acid, &c. The suggestion was first made by Dr. Ure.

V. Tannic acid.— Called also, tannin. It is found in almost all plants which are astringent: the astringency being due to the tannin. Although not sour, &c, it neutralizes salifiable bases, & hence, is called an acid.
The best mode of obtaining it, is by the method of Pelouze.
A quantity of coarsely powdered galls are placed in a funnel shaped tube, closed below by some loose cotton. The tube is introduced into some recipient, & some commercial sulphuric ether is poured upon the galls. The ether passing through the powder dissolves all the soluble soluble parts, which passes into the recipient. The water which was with the ether & which has the tannin, separates from the ether, while the ether remains at top, with the colouring matter. If they do not readily separate, the addition of a few drops of water will cause them to do so. The part which settles to the bottom is a definite compound of Ether, water & tannin; by applying heat to it, the Ether & water will be driven off while the tannin will remain. Tannin is uncrystallizable; when pure

given in solution, it is said, not to produce inf. of the stomach, but to produce peculiar narcotic effects.
It is sometimes taken in mistake for Epsom salt. In a case of poisoning, evacuate the stomach, &c. as antidotes give chalk, or magnesia.

II. Citric acid. It exists in nearly all sour fruits: lemons, oranges, tamarinds, &c. It may be obtained from them, (lemon juice is generally used,) by forming a citrate of lime, by adding carbonate of lime, (chalk,) to the juice; this is decomposed by Sulphuric acid; sulphate of lime is precipitated, carbonic acid escapes, & the citric acid remains in solution, & which may be obtained in crystals by evaporation, &c.
For medical uses, &c. see Wood's Syllabus.

III. Tartaric acid. It exists in the juice of the grape very abundantly, & from which, it is chiefly obtained. It exists in it, as a bitartrate of potassa, which not being very soluble in alcohol is precipitated during fermentation. In this state it is very impure, & is called tartar, or argol. The tartaric acid is obtained, by adding lime to its solution, which destroys the excess of acid, & we have ~~a tartrate~~ of ~~bitartrate~~ potassa & of lime; to it, is now added, the chloride of calcium, ~~the oxygen leaves the~~ potassa & goes to the calcium, the chlorine combines with the potassium, while the tartaric acid of the tartrate of potassa, combines with the lime. These tartrates of lime are now decomposed by Sulph. acid, an insoluble precipitate, Sulphate of lime, is formed, while the tartaric acid remains in solution, from which it may be obtained by crystallization.
It is permanent in the air, very soluble in water, the solution after long exposure undergoes decomposition. It is also soluble in alcohol.
It is used chiefly as a test for potassa, forming a bitartrate, which is of difficult solubility, and is therefore thrown down.
It is often used to adulterate Citric acid. It may be detected, by adding to the solution of the citric acid supposed to con-

Notes,

taken from the Lectures of Dr. Wood,

on the

Proximate Principles,

of Plants, &c.

University of Pennsylvania.

Being introductory to a course on Materia Medica. October 1842.

The mode by which they are obtained from plants, is called, the proximate analysis.

They are all susceptible of being decomposed into their ultimate elements, by heat.

They may be divided into 3 classes: 1. acids, 2. alkalies, & 3. those which are neither acid or alkaline, or in other words, neutral.

1. Class. Vegitable Acids.

I. Oxalic acid. Found generally in plants combined with potassa or lime; it exists in different species of Rumex, Oxalis, &c. in the state of the binoxalate of potassa.

It is generally obtained for use, by the combination of its constituents: generally by the action of Nitric Acid on sugar, or starch.

It has all the peculiar acid properties: changing vegitable blues to red; neutralizing alkalies, forming salts, &c.

It effloresces on exposure. Soluble in water & alcohol.

Chemically- It consists of carbon & oxygen united in such proportion, that it is between carbonic oxide & carbonic acid, but as water is necessary to its existence, each equiv. of acid has one of water; besides this there are 2 equiv. of water of crystallization which are lost on exposure without effecting the intimate constitution of the acid.

Oxalic acid forms insoluble compounds with lime & magnesia forming insoluble & inert precipitates of oxalate of lime, or magnesia, as the case may be.

Oxalic acid is very poisonous- several drams have produced fatal results. It produces inf. of stomach, nausea, &c. When

from neglect, the more important diseases may originate; more particularly in unhealthy constitutions, as in scrofula, &c.

In healthy persons they are rapidly recovered from.

If the part be used too early, the effect of the injury may be kept up for weeks or years; whereas a little more attention would have removed all danger.

In unhealthy persons, a chronic form of inflammation is often set up, terminating in suppuration, caries, &c., so that amputation has often been necessary.

Therefore, after you have got rid of the acute symptoms, simply (rest & position being still continued) mild stimulants, with friction. The lin: ammon:; or of hydrarg:; or of lead may be used, afterwards making pressure by a roller; or the part may be envelopped in strips of adhesive plaister:- emp: ammon:; emp: ammon: cum hydrarg:; emp: galb:; &c, over these a roller.

Cold water poured on the part in a stream, has often very good effects.

Should the disease prove obstinate, counterirritate is advantageous. Blister, or ung: antim: tart:.

When the marks of disease have been removed, use moderate, & regular exercise.

great difficulty, & with the foot extended.

Cause of this feeling – is a laceration of some fibres of the tendo Ach:, or of the gast:, where it joins the tendon. Next day there is tenderness in popliteal, ecchymosis, which daily increases. The least attempt to bend the foot is accompanied with great pain, & followed by swelling of pain & ankle.

From negligence, lameness may ensue.

Treatment – Rest & position. 3 to 6 weeks to effect a cure.

Wounds of nerves. Approximation of position, & union by adhesion.

Sprains. An injury of lig: or tendons ~~around~~ a joint, which are either forcibly stretched or lacerated.

Usually produced from sudden extension.

Common seat. Wrist, & ankle, from falls.

Symptoms. Considerable pain at time of accident, part soon becomes swollen ~~from~~ the effusion of blood; it is increased by subsequent inflammation; there is tenderness which corresponds with the swelling. The skin is at first natural but becomes discoloured as the effused blood coagulates.

When inf: has been set up, & given rise to effusion of fibrin, a sensation of crepitus is experienced on examination; but differs greatly from that produced between the extremities of a broken bone.

The motions of the joint become impeded by the swelling, &c.

Treatment. Arrest hemorrhage from the lacerated vessels, ~~& prevent~~ the occurrence of more inflammation. For the first cold ~~applications~~; attention to position, effects much in arresting effusion, & preventing acute inflammation. Should the pain & swelling still increase use leeches freely, & encourage the bleeding by tepid water. Purgatives, &c. In very robust persons may bleed.

After the inflammation is subdued, the absorption of the effused matter may be effected, as from neglect in this stage –

Afterwards place a splint behind the limb.

Rigid abstinence, fumigations as much as possible avoided. In 8 days, cut the sutures, but continue the other applications. Patient should not be allowed to get out of bed before 3 weeks.

If inflammation follow, use leeches & an evaporating lotion; & if it run high bleed freely.

If suppuration be produced, fomentations & poultices locally; internally liq: am: acet: & opium.

A fungous granulation forms at the wound, which must not be disturbed, as it is formed to close the aperture; disturbing it produces fresh irritation.

When a limb is stiff from inf: & adh:, early motion is required, & its use may generally be restored.

A joint is not injured, but benefited by motion, except in scrofula, where rest is essential to cure.

A good exercise is sitting on a high table.

When the joint is not altered in form, partial anchylosis, may be relieved considerably, in young persons.

Osseous anchylosis is permanent.

<u>Removal</u> of <u>loose Cartilages</u>. Draw down skin, so as to make a valvular opening. Cartilage is fixed by an assistant, an incision made over it, as soon as exposed, it escapes from its situation, & then clips the skin.

When tendons are divided, approximate their extremities, & the position of the limb; retain it in such a position. If inf: arise, elevate the limb, & apply leeches.

Punctured wounds of tendons, said to produce tetanus. As in foot, palm of hand, &c. Treatment. Fomentations & poultices to tranquilize, by no means bleed or restrict the diet, because such treatment adds to the tendency to produce tetanus. If restless, or the wound painful, give opium.

Laceration of tendons, treated by approximation by position; &c.

Partial laceration of tendo achillis & gastrocnemius muscle.

In running, or slipping a person sometimes feels as if he had received a blow upon the calf; & is immediately unable to walk but with

Treatment. Approximation & position, &c. If inflicted with violence, &c. the larynx may be wounded, when the treatment as before is necessary.

Wd. below Larynx. When within 3 in. of sternum more dangerous than in any other situation. Symptoms are rushing in & out in respiration. The blood gets into the trachea, & excites coughing, by which a bloody froth is forcibly ejected. Of course no food pass through the aperture. If the cut. wound be small, as from a stab, the blood not freely escaping, lodges in the bronchia, & adds excessively to the dyspnœa.

Treatment — As in the others, stop bleeding, & if the wound be not large enough extend it, longitudinally, & tie left ends of vessel. If the trachea is widely open, use a suture, excluding the trachea, bend the head forwards; but do not use adhesive strips, as they prevent the escape of blood & air in coughing. &c. The ligature is to come away by ulceration.

Tracheotomy wound in trachea, is sometimes followed by loss of voice, on account of division of the nerves recurrens.

Wounds of Joints. If a poultice is applied, & the utmost attention is paid to the closure of the wound, inflammation of the synovial membrane arises, & suppuration ensues. Violent irritation succeeds, — shiving, heat, flushing, & profuse perspiration; generally great swelling & excessive pain in the joint. Abscesses form, one after another, in the different parts of the joint, until strength is exhausted.

In young & healthy constitutions, these wounds even in the largest joints are recoverable from; but, in aged & weak persons, they destroy life.

Anchylosis often follows, either ~~fibrous or bony~~ bony.

Treatment. Approximate edges with suture, avoiding the lig:, because the ~~synovia~~ synovia has a tendency to force itself outwards, & also is more abundant than usual, &c. Apply lint dipped in blood & plaister over it; then cover with linen dipped in lig: plumb: subacet:, & spirit.

Emphysema often follows wounded lung. Treatment. A bandage around the chest, as to prevent any rattling during a deep inspiration; the patient is to lie on the wounded side, & punctures may be made ~~[illegible]~~ into the cellular tissue, where it is much loaded, but not so large as the wound made in bleeding.

Wounds in Pericardium. 1 case mentioned which was fatal.

——— of the Heart. Rare. Almost immediately fatal.

——— of the Throat.

Ue. above the larynx. Most frequent seat of injury, which is inflicted whilst the chin is elevated.

Symptoms. Air & blood with force issue from the wound, especially on coughing. A lighted candle is blown out, & liquids when attempted to swallow, are violently ejected.

The wound passes through the muscles of the jaw & tongue into the pharynx, being generally inflicted between the chin & os hyoides.

The arteries wounded are the sublingual, seldom the carotids.

Treatment. Position. The chin to be depressed, put sutures in the integuments. Keep the mouth cool & moist, by acidulated water. Use nutritive clysters, to which add opium if they quickly return; & when the fever* has subsided, wine should be added.

Strictures of oesophagus. Use nutritive clysters.

Sutures should be removed in a week, & adhesive strips substituted.

When a wound is ~~[illegible]~~ situated below the os hyoides, & the epiglottis is injured at its articulation, it is generally fatal, from a want of defence to the airtube.

Wound into the larynx. Same symptoms, except that food does not pass out. The patient is also unable to speak.

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*. Wound is generally not dangerous; & when persons die shortly after, it is frequently from the fever which has led to the commission of the act, if it be not from hemorrhage.

Wd. of Spleen. Some cases have proved fatal. It has been wounded in tapping, when enlarged.
Ruptures; from goring of cattle, &c. have proved fatal.
Treatment. Rest. If accurately ascertained, pressure & a roller on the abdomen would be the best treatment. But little can be done.

Wounds of Kidney; are not fatal.

Wd of Bladder. Danger depends on being full or empty at the time.
Treatment consists, in leaving a catheter in the bladder, & enjoining perfect rest.

Wounds of Chest. Wounds of parietes are not attended with much danger. Bleeding from an intercostal to be repressed by pressure of the finger.

Of Lung. Symptoms. Coughing up frothy & florid blood; considerable irritation & tickling in the larynx, & by dyspnoea. If wounded by a broken rib it does not bleed so freely as when so, by a knife, &c. as it has the nature of a lacerated wound.

Treatment. Patient in either case, is to be freely bled, & the parietal opening must not be closed till the hemorrhage ceases, otherwise the blood remaining in the chest will produce inf: &c.

Inflammation of the pleura should be guarded against by antiphlogistic measures. If effusion of pus, following from neglected inflammation, or of bloody serum from having closed the external wound too early, paracentesis will be necessary if very great.

Care is requisite to attend to old persons; as fluid is very liable to be effused into the cellular tissue, causing death. Enjoin strict rest, & it is better to give digitalis than to bleed very largely.

operation for strangulated hernia; in which case the intestine has been accustomed to violence.

Treatment. Interrupted suture; the needle should penetrate the skin & muscle. If the muscle be not included, a hernia is sure to form afterwards. Between the sutures, strips of plaister, or lint dipped in blood. The patient should be freely bled. If local inflammation be great use leeches. Avoid purgatives; & food for a couple of days.

Wounds extending to the viscera. Rare. Dangerous. The danger is much lessened if the wounded portion protrudes.

If the stomach is wounded, a ~~small quantity of strong~~ nourish the patient with nutritive clysters, See A.C. for a case 2nd Vol.
if the large, after a few days, a little jelly may be allowed.

In a small wound of intestines, as in strangulated hernia, pinch up, tie, & pass to the mouth of sac, leaving the ligature hang out.

In a large wound of the intestine, I should make an interrupted suture, & return the intestine into the abdomen, letting the end of the ligature hang out of the wound, which otherwise I should close with great care.

Rupture of intestines from blows, followed by the following symptoms; viz. great depression, coldness, paleness; pulse scarcely perceptible if the rupture is large, & the patient dies in from 12 to 24 hrs. perfectly sensible.

If laceration be small, the symptoms are less violent; there is coldness, tension of abdomen, vomiting, costiveness, loss of appetite, subsequently great abd: tenderness & great emaciation.

Treatment. Perfect rest. Leeches & fomentations. Saline medicine, & avoid food for several days.

Wounds of Liver. From stabs, &c. Treatment. General bleeding. Locally, leeches & fomentations.

Wounds of Gall bladder probably fatal, from extravasation of bile.

Plantar arteries. Pressure locally. Tourniquet to thigh. If these fail tie the post: tib: art:, as it is dangerous to cut into the foot.

Styptics. Fine wool confined by a bandage, is one of the best. Sifting in flour adds to its efficacy. Turpentine with lint & pressure is good; but merely poured on the wound is powerless. Catechu; Bol: Armen:; Alum nat:; & Tinct. Opii; will stop the troublesome bleeding from leech bites.

Wounds of veins. In a healthy constitution of little danger, as they are speedily closed.
In unhealthy constitutions they inflame, suppurate, &c., producing death from hemorrhage, or inf. extending along vein to the heart.

Symptoms. After bleeding, a few hours, complains of tenderness, & requests to have the bandage loosened, pain next extends up limb; the wound looks red, & its lips are separated. Then the plexus of veins become swollen, hard, & very painful. High constitutional fever ensues. If the patient has sufficient power of constitution, abscesses form in the veins of fore arm; & by opening these early, great relief is afforded; but if the habit be particularly feeble, the abscesses do not form, but the pus remains in the veins, producing excessive constitutional irritation which is fatal.

The worst cases occur (if inf:) from the application of ligatures & the scalpel. Case of insanity produced from during the irritation, & did not recover mental faculties after.

Treatment. Position. A roller from extreme part of limb, to the wound, wetted with liq: plumbi subacet:, & spirit. Leeches freely, & if suppuration use fomentations.

Wounds of Abdomen. When none of the viscera are wounded, not dangerous.

The free motions of intestines upon each other, independent of the peristaltic motion, is a great preservative in wounds of & blows upon the abdomen.

Peculiar Symptoms. They immediately produce universal coldness & faintness, with nausea & faintness, excepting in the

apply a ligature above & below the opening. For Radial; same treatment.

Palmar arteries. Steady & continued pressure with compress & bandage; tourniquet to brachial artery; the application of cold, & attention to position of limb. Should these fail, & if the opening of the divided vessel cannot be found, it will be necessary to tie the ulnar artery; & then again they fail, if this also fail tie the radial. On the contrary, should the deep palmar arch be injured, tie the radial first & afterwards the ulnar.

Femoral artery. If wounded high up, thrust the finger in the wound to stop the bleeding, untill a compress can be applied upon the pubes, & the vessel be secured. If in the middle, apply tourniquet; cut down, & tie the artery.

Popliteal artery. Rarely wounded. Tie it; take care of the sciatic nerve, & the vein.

Post. Tibial artery. Rare. In upper part of limb, apply tourniquet, bend the limb; raise gastroc: mus: from tibia, so as to expose the artery & nerve, and apply two ligatures to the artery.

At lower part the artery is easily found, & secured behind the malleolus int:, avoiding the nerve.

Interosseal artery. Sir A.C. never saw a case. Cut upon the vessel from the outer part of leg, & seek it between the 2 bones near to the fibula.

When it is impossible to find the source of bleeding ~~the~~ or ~~but~~ after treatment tying the main artery, & hemorrhage occurs some time after, the best course to pursue is to amputate.

Ant. Tibial. Rare. When wounded above, make an incision on the outer edge of ~~the~~ tib: ant: muscle; apply 2 ligatures. When low down, raise it from the tendons of tib: ant: & ext: proprius pollicis, & secure both ends. When it is wounded in the dorsum of foot. Tie each extremity.

Punctured Arteries. Blood does not readily escape through ext. opening; & therefore coagulates in the cellular tissue, gradually increasing from the issuing blood; the impetus of the blood causes a pulsation; & the cellular ~~tissue~~ membrane has condensed, forms a sac, which impedes the evolution of the swelling. The ext. wound heals, & thus an aneurism is formed.

Differs from common aneurism in production, but is the same in character, & needs the same treatment.

Brachial artery has often been punctured in bleeding.

To prevent aneurism, apply a tourniquet to the ~~brachial~~ of the arm, & upon the opposite side only, leaving free anastomotic circulation.

If one still follows, the tourniquet is to be still continued.

Should the tumour still increase it is proper to take up the brachial artery.

Contused Wounds of—. Destroy vitality. The sloughing may give rise to secondary hemorrhage. Slough will not separate until from 8, 10, or more days.

Treatment— Rest, till the separation of slough; instruct him in the tightening of a tourniquet, which must be constantly kept on during the process.

Treatment of Wounds of particular Arteries.

Art: of Scalp. Complete division of injured vessel; application (permit retraction.) of pressure. Tourniquets used for pressure.

Aneurisms of scalp; the each communicating artery. They generally arise from some contusion or wound.

Carotid Artery. Generally speedily fatal. Die speedily, then afterwards examine & if any nerves have been included, apply a fresh ligature. (from art: above.) It is necessary to put a ligature on at first quickly, to prevent death.

Subclavian. Tying. Axillary. Tying.

Brachial artery when wounded in bleeding, apply a thick compress & a slight bandage. If aneurism occurs do as above.

Ulnar. From free connection with radial, it is necessary to

ter a time is often recovered from.

Treatment. The warm bath gives temporary tranquility; but its effects are not permanent.

Bleeding hastens the patient's death. Opium, &c. have been used with little effect in acute tetanus.

Chronic tetanus is sometimes relieved by opium & calomel, cold shower baths, iron, &c.

Trismus is rarely fatal. Calomel & opium are the best medicines; & a blister to the head the best local remedy.

Spasm in muscles of jaw is called trismus; when the muscles of volition & respiration, tetanus. Sometimes the posterior muscles are more affected, when it is called opisthotonos; when anterior, emprosthotonos.

Wounds of Arteries.

Incised wound of an artery. — Fainting is soon produced from the supply of blood to the brain ceasing; sensation & volition are soon suspended; & the action of the heart considerably suppressed; the flow of blood diminishes, & sometimes entirely ceases.

The orifice nearest the heart throws out red blood, that farthest from the heart, is of a dark venous colour, owing to its ~~flowing through~~ having passed through the capillaries; it flows in an uninterrupted stream.

The powers of the nervous system is soon restored; the patient recovering.

Bleeding is arrested constitutionally by fainting. Locally by coagulation, &c., aided by contraction of artery. When completely divided retraction of the vessel takes place.

Treatment. Pressure on the trunk by tourniquet, & gently at wound. If the vessel be large, ligate it on each portion. ~~of the incised vessel~~ When an artery is not completely divided, it prevents retraction, evaporation, &c. Treatment consists in wholly dividing the vessel, &c.

Lacerated arteries bleed but little. The coats are elongated & folded together, cellular tissue is drawn over the mouth of the vessel, &c. which prevent bleeding.

Treatment. According to size - apply ligatures, &c.

fomentations, poultices, &c. If after these applications, inflammation is still considerable, use leeches: but do not bleed generally, for all the powers of the system are required for separation.

Keep the bowels regular, combining opium to effect that object. If the constitution is much debilitated use Sulph: Quinia, or Ammonia with opium, &c.

When separation is completed, throw aside the poultices, &c, & approximate parts by adhesive plaister, or simple dressing; treating it like a simple ulcer.

<u>Punctured Wounds.</u> Often dangerous, from consequent inflammation of absorbents, &c.

<u>Symptoms.</u> A slight wound followed by severe pain, red lines running from the wound, &c. Abscesses are sometimes formed upon the absorbents, in their course, &c.

The effect of these wounds depends much upon the form of the instrument, & the state of the constitution.

Treatment. Extend the puncture into an incision, by a lancet.

Prep the surrounding parts. If the finger is wounded tie a piece of string tightly around it.

Apply caustic to the wound.

Use cooling lotions. Leeches, fomentations, & poultices if inflammation become considerable.

Give calomel & opium at night, & a brisk purgative in the morning.

Support the wounded children.

Of course stimulating food & drink should not be allowed.

When a puncture is made into a thecca, suppuration is apt to ensue. An early incision, by allowing the discharge of matter, prevent great mischief. Lance holds good when matter forms under the aponeurosis palmaris. To prevent the suppuration use leeches, &c.

Tetanus often results from these wounds. Acute tetanus generally terminates the patients existence; chronic af-

suture at the angle.

Sutures are not injurious for with a cooling lotion, they are often better than adhesive plaister. Adhesive plaister should not be applied to the edges of the wound, it is liable to produce erysipelas.

Adhesion prevented by following causes.

1. Union & adhesion may be prevented by many, & large sutures. = Use fine threads, cut one end off; in from 4 to 6 days they should be removed; thus preventing suppuration, &c.
2. By inflammation being suffered to run too high. Use antiphlogistics.
3. By too little inflammation, from debility.
4. By poisons; thus the bite of a rabid animal should be excised, & then cauterized.
5. Caustics necessarily prevent adhesion.
6. When many absorbent vessels are cut, the lymph prevent union.
7. When secreting glands are wounded, their secretion prevents union.
8. It is often frustrated by pulling off the bandages too early.
9. State of constitution. If irritable use opium, & apply evaporating lotions, &c.

Lacerated Wounds. Bleed much less than incised wounds.

Should be careful to cleanse the wound, with a sponge & warm water, from foreign matter.

They are more disposed to inflamme. Require evaporating lotions, leeches, &c.

The nervous system frequently suffers.

More liable to produce erysipelas than incised.

Treatment. Cooling lotions, &c. On the first appearance of spasmodic symptoms, use opium.

Patients with lacerated wounds, should not be much reduced by depletion, as it disposes to tetanic symptoms.

Contused Wounds. Differ from the above, in being accompanied with disorganization.

If a separation, considerable inflammation, ulceration &c. must take place; & the cavity must be filled by granulation.

These wounds bleed little.

Treatment. Facilitate the separation of the dead parts. Use

11. Phrenic Hernia. Protrusions either at the natural apertures, or at unnatural openings either from malformation or injury.

Symptoms. When this hernia exists, it causes an interruption of respiration, coughing, besides the symptoms of the hernia.

This hernia has, or has not a proper sac, according to the circumstances of its formation. When it is consequent to a laceration, none exists; &c.

The patient is in danger of strangulation, &c.

Could the precise nature of the disease be ascertained during life, but little could be done, excepting what mere feeling would dictate; viz. rest, &c.

12. Mesenteric H. In consequence of a natural deficiency ~~of the~~ of the layers of the mesentery, or from an accidental aperture.

13. Mesocolic H. Similar to the last.

The intestine may be strangulated in various ways in the abdomen.

Wounds.

Incised. Fainting is produced if an artery be cut, but rarely, if the bleeding be venous.

Treatment. Bleeding from small vessels - pressure. Large - tie.

When bleeding ceases, sponge the surfaces & edges of wound from coagulated blood, bring the edges together, & apply a strip of lint, or linen dipped in blood, apply adhesive plaster over the lint, with spaces to allow the escape of blood & serum.

In wounds of the muscles the position of the limb should be carefully attended to. If the wound be in a muscular part, which is not supported, as in the cheek, use a fine suture. An angular wound requires a

7. **Vaginal Hernia.** Protrudes between uterus & rectum, at the posterior part of vagina; occasionally at one side. Only covered by lining of vagina.

Treatment. A pessary.

8. **Perineal Hernia.** In the male, between bladder & rectum; in female, between vagina & rectum. Sir A. C. saw but 1 case, & that in the dissecting rooms.

9. **Vesical Hernia.** Very rare. Symptoms. Size of tumour varies, & is not much affected by position of the body: but is most affected by the quantity of urine contained in the bladder. Sometimes the part ~~capable of being filled with~~ within the pelvis empties itself, while the part ~~within~~ outside remains distended as before the attempt to void the urine. Persons labouring under this complaint sometimes, therefore, raise the scrotum & press upon it to empty it. It gives rise to a frequent desire to pass urine.

The tumour is not perceived of the transparency of hydrocele.

(Rare form) Treatment. An inguinal truss. Paying unremitting attention to the frequent & complete discharge of urine. The cure is easier than in other forms of hernia, as it is aided by the muscular coat of the bladder. But if, as it does sometimes, it has drawn down peritoneum, intestine, &c. with it, it will then be as difficult as a common inguinal hernia.

It is hardly possible for a strangulation to occur, unless a calculus forms in the protrusion, producing irritation, & its consequences.

10. **Ischiatic Hernia.** Extremely rare. Sir A. C. only 1 specimen. A portion of the ileum was discovered passing by (after death,) the right side of the rectum to the isch: notch, through which it protruded.

If such a hernia should be ascertained to exist, if reducible a spring truss might be applied; but if strangulated I would recommend dividing the structure directly forwards.

In some cases the intestine adheres to the mouth of sac, so that great care is requisite to avoid wounding it. The separation of them must be effected with as little violence as possible, by means of the fingers, to allow of the safe division of the stricture.

Strangulation has occurred from an absorption of part, or a laceration of the hernial sac, &c.

If the adhesions are extensive & firm, you must be content with liberating the stricture.

The part protruded, is generally, a portion of the colon; the appendices epiploicæ, if much charged, should be cut off.

4. **Ventral Hernia.** Usually situated at the linea alba, or semilunaris. It is accompanied by the usual symptoms, except when lift up & the stomach is protruded.

Causes. Natural deficiency of tendinous structure; apertures for passage of blood vessels, unusually large; injuries, &c.

Coverings generally the same as those of umbilical.

~~[illegible]~~ Treatment. Same as in umbilical.

5. **Thyroidal, or Hernia of the Foramina Ovalia.** Through the opening for the vessels

In case of strangulation if discovered, an operation is necessary, which is extremely difficult. Divide the stricture inwards, to avoid the art: obturat:.

Reducible. A crural hernia truss, with a thicker pad, would prevent further descent.

6. **Pudendal.** Appears in the labium externus pudendi, about its middle. It commences on the side of the vagina, & passes into the labium between the vagina & ischium; it has usually a pyramidal figure, & presents the characters of other hernia, as elasticity, dilatation on coughing; appearing when erect, &c. Its want of connection with the abd, inj. &c. are sufficient to distinguish it.

Treatment. To prevent increase, wear a bandage; but a partial protrusion cannot readily be checked, as a pessary usually large is of no service.

to cover a considerable extent, so as to support the muscles, as well the Hernia.

Irreducible U. Hernia. Becomes so from the same causes as the others; viz. adhesions, growth of omentum, &c.
Exposed to constant danger from violence.

Treatment. A hollow pewter pad, covered with soft leather, if the hernia be small.
If very large; it must be supported by bandages passing over the shoulders.

Strangulated U. Hernia. Symptoms, generally not so urgent as the others. Causes. Indigestible food, occasioning flatulence, &c.

Seat of stricture. Usually at tendinous opening through which the hernia protrudes, but sometimes the neck of the sac is thickened, & prevents reduction.

Treatment.- Taxis - Patient being incurvated. The pressure should directed a little upwards, as well as inwards.
If too large to grasp with the hands, make pressure by means of some broad surface steadily for 20 or 30 minutes.
Should taxis fail, try the general remedies.

Operation - An incision across the swelling at the lower part; next a perpendicular cut connecting the other at right angles ⊥.
Dissect up angles. Divide superficial fascia very carefully, in the same manner as if it were the hernial sac itself. If the hernial sac be perfect cut into it, &c. as before. Generally there is a small quantity of fluid. Divide the stricture upwards, towards the cartilage ensiformis.

If the intestine is in a fit state cautiously return it, &c, as before; if omentum large & in a doubtful state cut off, &c.

After treatment. Bring edges together by sutures, finish by adhesive plaister; apply a compress, & a bandage around the body.
This is of great importance to promote union by adhesion.

In large hernia, a small opening only, should be made over the neck & the stricture divided, &c.

of swelling is uneven & doughy, & is but little tender under considerable pressure.

When there is both oment: & inter: they may be distinguished by the above-marks. The omentum is usually above, the intestine below.

It is common in infants.

In adults. In fat persons, sometimes scarcely perceptible.

When of long standing, & large, the hernial sac is in a few instances difficult in part.

2 sacs have existed at the same time

It is most frequent in women. Cause. ~~Relaxation~~ Pregnancy.

Children are sometimes born with a deficiency of muscle at the umbilicus, giving rise to a large protrusion. Skin often so thin as to see convolutions of intestine.

A small ~~tumour~~ sometimes projects from the navel of children, which has been mistaken for hernia.

Sometimes the funis projects beyond the navel, preventing cicatrization. Treatment, a ligature followed by scissors next day. Sir A.C. saw 2 cases of this kind.

Treatment of Reducible Umbilical Hernia.

In infants, apply half an ivory ball, & confine it by means of adhesive plaster. A linen belt should be applied, & secured around the body, but as soon as the child begins to walk, 2 straps must be fixed to the lower part of the belt which should pass under the pelvis, between the thighs, to prevent the belt from slipping.

In the adult, or even for children, when the hernia is small, a spring truss may be employed. It should pass from the front to a little beyond the spine; a strap should complete the circle.

In fat persons, as the navel is deep, the portion of ivory may be placed under the pad; as it is better than having a conical pad, as it will not follow the motions of the pad

Large hernia, with a lax state of the abd: requires a large

In some cases where the hernia is large, strictures may be found both at the crescentic edge of the fascia lata, & under Pts lig.is

So that after dividing the stricture, you should feel if there is another, before endeavoring to return the protrusion.

Great caution is necessary in dividing the stricture, if the protrusion be entirely intestinal, & the knife should not be introduced, untill the intestine has been carefully placed out of danger by an assistant.

If the protrusion adhere to the sac, or the intestine, &c. be gangrenous, the same treatment is necessary as in inguinal hernia.

Closing wound & after treatment, same as in inguinal hernia.

Sometimes, but rarely, the obturator artery arises from the epigastric, & surrounds the neck of sac.

The best mode of avoiding injury to these arteries, is to make a very slight division of the stricture, with the knife; & then, by pressure of the finger, or of a director, to enlarge the opening.

Fluid has been found between the fascia perpria & the hernial sac.

Umbilical Hernia.

Synonyme. Exomphalos.

The umbilicus is usually closed by dense cellular tissue, the remains of the umbilical veins & arteries, & not by tendinous structure.

Commencement. About the size of a nut, can be easily reduced. But returns on any exertion, &c. If neglected it soon increases; & as it augments, it gravitates.

If intestinal, & not supported, it is attended with danger, & it creates much suffering. Patient frequently feels weak, with a sensation of sinking. Bowels are irregular, there is much nausea with flatulence.

When intestinal may be distinguished by elasticity, uniformity & the passage of air through the canal producing a gurgling, &c.

When omental there is little uneasiness, or disturbance. The feel

Taxis.— Patient ♁ to sufficient space between for the hand. Prep tumor downwards, until below P's lig: then thread upwards towards abdomen.
Pressure should be gentle & continued. If it fails use the other means. These remedies are less effectual than in other forms of hernia. Patients in generale will not survive 4 days.

<u>Operation</u>. Remove pubic hair; empty bladder; place patient in the above position.
1st incision, a little above superior part of tumor, towards umbilicus; extended downwards, somewhat on inner side of tumor, as far as middle; a 2nd incision, at right angles to last, from inner to outer side of tumor. ⊥.
Dissect up the angular flaps.
Superficial which is now exposed, is to be divided in the same manner. The covering formed from the femoral sheath should be carefully cut into, so as to admit a director, which should be freely opened, to expose the hernial sac. Sometimes, (if the patient be fat.) a layer of adipose matter may be found between this covering, & the sac itself. This fascia has been mistaken for the hernial sac, the hernial sac being thrust in the abdomen, & a strangulation existing in it, the patient died.
Having exposed the hernial sac, pinch up a small portion of its anterior & lower part between the finger & thumb, carefully excluding any portion of the contents, then place the knife horizontally, & cautiously make a small cut, of sufficient size to allow the passage of a director; upon which cut the sac upwards & downwards.
A quantity of fluid usually escapes when the sac is opened. It is sometimes not found.
If inflammation runs high the intestine is covered & adhesion matter.
The seat of stricture should be distinctly ascertained with the min: digitus."
If the hernia be large the stricture may be at the opening of the fascia lata; but it is generally found beneath P's lig:, in the mouth of the sac itself.
In either case pass a director, anterior to contents of sac, pass in the knife, & cut upwards & a little inwards.

Varicose vein. Distinguished, by feeling an iliac vein above, while recumbent, & if it is a vein the tumour immediately appears.

This hernia is most frequent on the right side.

Mothers more liable to it, than others; because of the relaxed state of the parts.

It is most frequently intestinal. Rarely omentum. Occasionally both.

Treatment of reducible femoral hernia.

There is considerable danger of strangulation from the small size of opening.

Use a truss. The pad should project downwards, nearly at right angles. To press upon opening under P. lig; & on upper part of thigh.

To be constantly worn. Rarely cured, because of the difficulty of keeping pressure, Poup: lig: & the fascia lata, supporting the pressure.

When the femoral opening is large, a large pad & strong springs should be used, keeping pad more effectually in place, by means of a strap passing around the upper part of thigh.

Double hernia. Double truss.

Irreducible femoral hernia.

Form adhesions of protrusion to interior of hernial sac; growth of protrusion within the sac; a contraction of neck of sac &c.

Treatment. Truss with a hollow pad.

If the hernia be entirely intestinal the truss cannot always be worn, as it sometimes creates severe pain.

Strangulated femoral hernia.

Symptoms. Same as usually more urgent on account of smallness of opening.

They die sooner.

Medical treatment. Same as before.

downwards, in the direction of the saphena major vein.

Dissection. Integument; fascia superficialis becoming dense from pressure. Under this a portion of femoral sheath, which is perforated for the entrance of absorbent, envelopes the hernial sac. (called fascia propria.) Between this & the sac, there is generally some adipose matter situated. It has been mistaken for omentum.

The sac differs from that of inguinal hernia; the fundus bears a very large proportion to the orifice.

In the male from the Sym: pubis to centre of orifice of sac, 2 in. The centre is about 1 in. from ext: illiac artery; vein nearer. ——— 3/4 in ——— origin of epigastric.

In the female the measurements, generally, are from 1/4 to 1/2 in. greater.

The s: cord of male & round lig: of female, about 1/2 in. ant: to the mouth of sac, being first on outer side, afterwards crosses it to front part.

General symptoms - same as in inguinal.

Enlarged gland liable to be mistaken, &c. Examine attentively, & inquire into history.

Sometimes exist together - when there must be a minute examination made.

Psoas abscess. Mistaken for it, &c. as it has many of the general symptoms. Distinguishes, by fluctuation preceding swelling, in the loins, general constitutional derangement, more rapid increase, & absence of intestinal derangement.

Inguinal hernia. Danger if taxis applied by mistaking it for ~~the disease~~ inguinal hernia.

The best marks of distinction are, neck of femoral below P. lig: & to outer side of spine of pubes, while inguinal is above the spine; by drawing down fem: her: P. lig: may be traced above it, which it cannot be if the disease be inguinal.

When irreducible, or strangulated, the same treatment is necessary as in the other varieties of inguinal hernia.

Operation. Having laid bare the tunica, it should not be opened so low as to expose the testicle. Generally a larger quantity of fluid escapes than in common ing: hernia. Seat of stricture is generally under the edge of trans: muscle, or at the int: ring. Divide the stricture as before, & return the protrusion, if not adherent. If extensively adherent, the stricture is divided, but the adhesions are not to be separated, unless very few & slight; the wound should be healed & a truss for irreducible hernia will be required.

Encysted hernia of the tunica vaginalis. | How formed. The tunica vaginalis becomes closed, by adhesion, opposite the abd: ring, but remains open above & below it; when a protrusion occurs, this adhesion of the tunica becomes elongated, forming a distinct sac within the tunica vaginalis.

Operation. When strangulated. Open the tunica freely, to expose the sac. Stricture at the mouth of the sac.

Crural Hernia.

Commencement. 1st Pain experienced on suddenly straightening the limb. Cause - extension of fascia lata, &c.

On examination a fulness is observed at the inner & upper part of the femoral sheath, disappearing on pressure, or recumbence. Fulness gradually increases, to size of walnut, which is seated below Poupart's ligament, inner side of femoral vessels & outside spine of pubes. As it swelling increases, it projects more forwards & upwards, turning over P. lig., as it meets with least resistance in that direction. When small, &c. it has much the appearance of an enlarged gland.

Direction of hernia. 1st little downwards in the femoral sheath, then obliquely inwards & forwards, & lastly upwards; sometimes

operation; passing the finger all the way to the stricture, slit up the canal & sac towards the ant: sup: spin: of ilium, so as to expose the extravasation; pass under it the stricture a director & divide it.

After treatment same as in male.

concealed ing: hernia Treated in the same manner as in males.

Congenital Hernia.

Contained in tun: vag: testis. The hernia has no proper ~~sac~~ peritoneal coat. Sometimes takes place in this cavity in the adult. This hernia originates from the descent of the testicle.

Distinguished from common oblique hernia, by its being confounded with the testicle, being perfectly distinct in the oblique. In the former it has the appearance of a hydrocele; especially, as sometimes happens, a quantity of fluid descends, which upon a close inspection, gives a transparent appearance to the swelling. To distinguish these joint diseases, the patient must be laid down; then moderately pressing on the epi: abd: ring, with the finger, so as to prevent the descent of intestine or omentum; if the patient then assumes the erect position, the water escapes into the tunica, but the intestine or omentum are felt pressing against the finger above.

Sometimes the testicle does not descend to the bottom of the scrotum, & then if hernia form, the tunica elongates, & reaches below the testicle.

In this form of hernia occasionally, the cord is divided, the blood vessels on one side, the vas deferens on the other.

Reducible — Requires a truss, provided the testicle has completely descended into the scrotum. For the first three months a pad & bandage may do. If the testicle has not descended nothing should be employed.

After the truss has been worn for some time, the tunica vaginalis becomes closed at the upper part, & near the testicle, but sometimes remains open between, in which hydrocele sometimes forms.

Causes. violence, &c. laceration of trans: tendon.

Seldom becomes large.

Treatment. When reducible a truss, the pad of which is to go over the opening.

Irreducible, ~~Treatment~~ same as in direct ing. hernia.

Strangulated. Taxis applied upwards & inwards.

This hernia may apparently be reduced by the taxis, & strangulation still exist. May be known by symptoms still existing.

Operation. An incision in the course, & from the upper to the lower part of the tumour. Then divide the fascia. The hernial sac is now opened from an inch below the ring to the lower part of sac. Pass in the finger, & then the bistory & cut the stricture. If the contents are fit or unfit to pass into the abdomen, do as before directed. The parts anterior to the sac above the ring, are the tendons of int. oblique & transversalis.

Inguinal hernia in the female. No coming of the sac by the cremaster muscle. The hernia follows the course of the round ligament, & forms a tumour at the upper part of the labium.

Seldom large. Causes & symptoms same as in male. Less liable to be mistaken for other diseases than in the male.

Distinguished from femoral. In inguinal the neck of the tumour is above Poupart's ligament, in femoral below; in the former the spin: process of pubis can be felt outside the swelling which cannot be in the latter.

Reducible. A truss.

Irreducible, same treatment as in ~~female~~. If intestinal & small, a truss with a hollow pad; if omental, a common pad; & when the hernia is large apply the T bandage.

Strangulated, same treatment as in male. In the

great difficulty in their reduction; they are liable to be lacerated from the violence used in their reduction, & even if it can be returned, the slightest exertion will occasion a further protrusion. Taxis also on such a surface may produce inflammation. Extensive adhesions sometimes have been formed between the hernial sac & contents.

Operation. - Merely expose the upper part of the sac, & divide the stricture without opening the peritoneum, unless the stricture happened to be seated in the mouth of the sac itself, when the sac must be opened carefully at the upper part only, so as to allow the division of the stricture.

Avoid violence in the reduction of the parts for reasons above mentioned. When cured if the hernia protrudes use the laced truss

Concealed inguinal hernia. Merely a fulness above Poupart's ligament seen. When strangulated, characterized by the usual symptoms.

When strangulated - often mistaken for cases of peritoneal inflammation, the patient being unconscious of any swelling; & thus may fall a victim.

Operation. - An oblique incision, commencing opposite the int. ring, & terminating a little above the ext. abd. ring. This cut should divide the integument & superficial fascia, exposing the tendon of ext. oblique, carefully cutting through it in the same direction, when the sac will be seen covered by a very thin fascia, which is given off at the int. ring. Part of the cremaster covers it below. Open the sac with the usual precautions, & the stricture at the int. ring, is to be divided, by first passing a small director under it, & then using the knife upon it.

Direct Inguinal Hernia. Protrudes at ext. ring on the inner side of the of the epigastric artery, pushing the spermatic cord to the outer & upper part of the tumour. A covering formed by the tendon of trans: & fascia trans: is next seen beneath which is the hernial sac.

Distinguishing marks. Situation of the cord, in oblique being behind the tumour; direction of [redacted].

As the safety of the patient depends much on ~~[illegible]~~ preventing evacuations, the exhibition of opium even after the operation, should, if possible be avoided; but if the irritability of the stomach continue, & the patient have a troublesome cough, it should be administered with calomel.

The bowels should be kept open, for several days after the operation. Patients have died in a few days after from constipation & peritoneal inflammation.

Should the patient go on well, the wound should be dressed on the 3rd day, & afterwards daily. The sutures may be removed on the 4 or 5 day; but the patient must be kept in bed until the wound is entirely closed.

The operation early is generally successful. Sometimes the intestine does not recover its function, when the vomiting & constipation continue, & the patient dies.

Peritoneal inflammation still continues sometimes, in which case the abdomen is extremely tense & tender, although the bowels are open, & death even ensues. The best means of relief is G general & local bleeding, fomentations, & extremely low diet; Sir A.C. also says "[illegible]", but see Dr. Jackson's Notes P.9. Vol. I.

Occasionally there is violent diarrhoea, ~~[illegible]~~ & producing great debility. Treatment – small doses Opii frequently; injections of starch & opii with a light nutritious diet; gruel, milk, ~~isinglass~~, &c.

Troublesome hiccough sometimes continues in consequence of peritoneal inflammation, entirely unconnected with gangrene.

The operation does not prevent future protrusion, & the patient must wear a truss afterwards. Lint may at first be placed under the pad, to protect the cicatrix.

The removal of the sac which has been recommended is not a successful operation ~~[illegible]~~ to prevent future protrusion.

Large Hernia. Operation differs in very large hernias.

When a large hernia has existed for some time, the cavity of the abdomen becomes diminished, occasioning a

or near the stomach, because of the small surface for the absorption of chyle being inadequate to produce sufficient nourishment. If low down no danger, as there is but little interruption to nutrition.

In artificial anus be careful to prevent inversion of the intestine as it will prevent the probable recovery of the patient.

Sometimes in a fat patient, the appendices epiploicæ are sometimes found more diseased than the intestine, so much so that they may be removed.

After returning the intestine, examine the omentum & if healthy & not large in quantity return it very gently into the abdomen. If a large portion be protruded, a part may be removed without danger, if the arteries be large enough to afford troublesome hemorrhage secure them with fine ligatures; the divided surface should then be returned to the mouth of the sac, serving as a plug, & the ligatures should hang out the exp. wound.

<u>Omentum mortified.</u> Known by crispy feel, distinction of veins from coagulated blood; or even if there is even any suspicion of such a state, remove it by excision at the sound part. In doing this drain it down a little, so as to expose some of the sound part, which should be held by an assistant to prevent sudden retraction into abdomen, while the part is cut off; bleeding vessels tied as before. Should unsound omentum be returned into the abdomen, the patient's danger is increased.

A sloughing of it, has taken place in the abdomen, poultices have been applied, &c. at the wound, & the slough has separated, & the patient did well.

When omentum is adherent to the sac, it may be freely separated, tying vessels, & returning.

If the omentum be much hardened, remove it.

<u>Treatment afterwards.</u> Cleanse the wound, bring the edges together with 2 or 3 sutures, according to extent of the wound. The approximation may be assisted by strips of court plaster, apply a compress over the wound & apply a T bandage. The position in bed should be moderately incurvated. Recumbence strictly necessary.

If the patient have not a stool a few hours after the operation give a cathartic, or a purgative enema, containing colocynth, or castor oil, & foment the abdomen.

From any sudden exertion or straining, which occasions a further protrusion, this part of the sac is forced into the inguinal canal; when recumbent it returns to its former position, ~~[illegible]~~ while part or the whole of the contents of the sac returns into the cavity of the abdomen. This occurs again & again; but at length the sac becomes elongated, the thickening no more returns to its former position when the contents of the sac are reduced; but it remains in the canal, & may at any time be the cause of strangulation.

Treatment.— Expose the contents of the sac as far as the stricture & divide it as before described.

Stricture of external ring— Divide as before. Not necessary to make so large an opening.

Strictures. The division of strictures in all cases of strangulated inguinal hernia may be made parallel with the linea alba.

Examination of Viscera. Examine the protruded intestine, particularly the strictured part, & ascertain if the circulation be restored, by pressing on the vessels, & observing if they be again immediately filled. If it be free, return the intestine by small portions at a time. Position — same as when taxis is employed.

Intestine gangrenous. It will have a fetid smell, the peritoneal surface will have lost its brilliancy, of a dark colour, with greenish spots; insensible, & will easily give way under pressure.

In such a state ~~[illegible]~~ the stricture ~~[illegible]~~ being cut, make a free incision in the gangrenous intestine, to allow ~~the fæces~~ to escape, & then return it to the upper part of the sac if large, but if the intestine be small do not disturb the adhesions to the sac; then apply a poultice.

When the patient will not submit to an operation, or proper means employed, & gangrene takes place, the hernia sometimes returns into the abdomen, & the patient soon dies. Sometimes the skin, &c. inflame, & slough & an artificial anus is formed, which is seldom closed.

Artificial anus is dangerous; if the opening be in the jejunum

the tumour, & rubbing between the thumb & fore finger of left hand; if any intestine or omentum be included; raise a fold portion. Being satisfied that he has the desired portion, place the edge of the knife horizontally against it, & make an opening large enough to admit the director, which is then to be introduced, & the sac divided.

Appearance of hernial sac. | Usually a bluish tint, & semitransparent. If the contents are not adherent to the sac, it generally contains a quantity of fluid, on opening which, it escapes; the fluid is occasionally serous coloured, frequently darker, & sometimes has an offensive smell. The fluid is generally most abundant in intestinal ~~the omentum~~ hernia. When the intestine adheres to the sac, or the hernia be omental, little or no fluid is found.

On the sac being opened, if ~~the omen~~ both intestine & omentum have been strangulated, the latter is found above & anterior to the former; sometimes covering the gut partially or ~~thereon~~ wholly.

If the hernia has not been long strangulated, the omentum has much of its usual character, only having the veins distended & a little darker; but the intestine is found covered with a thin coat of adhesive matter, & is of a red colour. When it has been long strangulated, or the stricture has been unusually tight, it presents a dark brown chocolate colour.

Seats of stricture. 1. At int: abd: ring; 2. At ext: abd: ring; 3. In inguinal canal. Most frequent at int: ring; occasioned by pressure of int: oblique & transversalis.

For further steps of the operation, see Gibson's lectures. ~~For further steps of operation see~~

The knife grasped by the finger should be passed carefully in, & carefully withdrawn.

Sir A. C. has recommended a way of dividing the stricture without including the sac. Divide the tendon of the ext: oblique a little above ext: ring, gently draw down the sac, while the muscles are drawn ~~up~~ by an assistant. The stricture is in this way found, & can be divided without risk, & without including the peritoneum. This mode has many advantages: if the epigastric artery be cut by some mistake, the flow of blood would be perceived, & the vessel might be tied.

Stricture in inguinal canal. Formed, by the pressure at the int: ring, which produces a thickening of the neck of the sac.

Substitutes for ice. Mur: Ammon: & Nit: Potass: & water, &c. in a bladder.

Opium should be given to allay vomiting, especially after bleeding.

When the above means fail, you must operate.
There is little danger in the operation, but there is great danger in delay. It is extremely important to operate, if possible, before the abdomen becomes tender under pressure, as it indicates the extension of inflammation to the cavity of the abdomen.

If the pulse be extremely small, & anxiety, no time is to be lost; but even with these & hiccough, & even with gangrene the operation has succeeded.

The progress of inflammation, varies in time exceedingly.
A large hernia completely strangulated, is more quickly fatal than a smaller one; but the latter requires an operation oftener.
An intestinal sooner fatal than an omental, an entero-epiplocele between the two.

Old hernia are not likely to be reduced, because the parts are more easily relaxed.
They are also more easily reduced in young & old age than in middle aged. Not so rapidly fatal in old persons.
because fibrous structure firmer.

Operation.- The bladder to be emptied by patient, hair shaved off pubes.
The patient should be in an inverted position: separate the thighs, & allow the legs to hang over the edge of the table.
1st cut through skin, &c. entering from opposite the ext: abd: ring to the lower part of the tumour. If the hemorrhage, from the ext. pudendal artery be troublesome tie it. The fascia of the cord is now exposed, cut through in the centre, so as to admit a director, which with a knife cut upwards & downwards. The cremaster muscle is now brought into view, which is to be divided in the same manner. The hernial sac now exposed, picking up a small portion at the ant. inf. part of

The patient should void his urine, & keep quiet. Place yourself on the right side, then apply the finger & thumb of the left hand upon the neck of the tumour, & embrace it with the right hand, & gently press it from side to side, directing the force in the direction of the descent of the hernia.

The pressure should be maintained from 1/4 to 1/2 an hr. The longer the tumour has been strangulated, the more dangerous it is to use much pressure.

The sudden relaxation of the abd: muscles during coughing, will sometimes assist in the reduction.

The intestinal is more easily reduced than the omental hernia. The former goes up with a gurgling noise. If from want of elasticity, the hernia is found to be omental, more force may be used in its reduction.

If the above means are not successful, take from 12 to 20 z. blood, according to strength of constitution. The thread pulse is no objection as it will be fuller after the evacuation, besides you guard against subsequent inflammation. Then put him in a warm bath 100° gradually increasing the heat till the patient feels disposed to faint, which usually takes place in 15 or 20 minutes. Then attempt reduction.

Extreme depression is sometimes induced by the strangulation, so that very slight causes induce syncope, from which the patient is with difficulty aroused. The two best remedies are the tobacco clyster, & the application of cold.

There is some caution necessary in administering the tobacco. When it acts in the manner desired, it produces extreme languor, a weak & quick pulse, cold sweat, & great universal relaxation. In this state the hernia may be often reduced.

Cold may be applied; by filling a bladder with small pieces of ice, wiping it dry & laying it upon the hernia. If after 4 hrs. the symptoms become mitigated, & the tumour lessens, it may be persevered in some time longer, but if they continue, remove the application.

Do not apply the ice directly upon the tumour, as the melting ice may occasion frost bite, &c.

adhesions are found. At the strangulation, the intestine is either ulcerated through, or readily separates. If the inflammation has been extensive, there is a quantity of air in the surrounding cellular membrane.

The inflammation of hernia is peculiar: owing to a difficulty to the return of the blood it becomes congested, changing from the arterial to the venous hue. This appearance has been mistaken for mortification.

The intestines are distended above the stricture; below contracted.

In strangulated omental hernia the symptoms are much less violent than in the intestinal species. There is not so much constitutional irritation.

Post mortem appearance. Little changed from natural appearance, perhaps a little darker colour, sometimes emitting an offensive smell. Leaving any fluid in the sac.

Seat of Stricture. Generally at the int. ring; in old hernias at the ext. ring very often.

Causes of strangulation. A spasmodic action is sometimes produced; the sac as it enters the upper ring, excites the muscles of the irritation, they contract upon the hernia. The principle cause, is the descent of an additional portion of intestine & omentum, increasing the pressure made by the stricture upon the blood vessels, &c. Any exertion may predispose the hernia to strangulation.

Small hernia are more easily strangulated than large ones, the stricture acting with more effect upon a single knuckle, than upon a large & voluminous hernia, &c.; & a recent hernia is more liable to it, than an old one, because in the old one the parts have dilated considerably.

Treatment. Taxis. The abdominal muscles should be relaxed by incurvating the body forwards.

All that can be done in an irreducible intestinal hernia is, to apply a bag truss, to prevent increase. If it can be found not to be omentum, a spring truss may be used, which will prevent the subsequent increase, or descent of intestine. The truss should not be applied until the most careful examinations, the spring should be weak, & should it cause pain throw it aside.

Sometimes the omentum becomes diseased.

Strangulated Hernia. Caused by such a compression of the blood-vessels as to excite inflammation, & totally to interrupt the passage of fæces.

Symptoms. Pain in tumour, sensation, as if a cord was tied around the upper part of abdomen, or round umbilicus. Then succeed eructations, vomiting, & generally, an anti-peristaltic motion, causes bile to be thrown up. Vomiting of fæculent matter when strangulation of colon.

1st Stage. Obstinate constipation attends vomiting, so that no stool is obtained, except from the portion of intestine below the strangulation by means of glysters. Pulse quick, & at beginning hard, tumour becomes red & painful, leaving an impression from the pressure of the finger, indicating effusion of fluid into cellular tissue. Abdomen slightly tense & sore upon pressure, body covered with sweat. Hiccough comes on, anxiety, pulse small & thread, so as to lead one unaccustomed to the disease, to think the patient dying. These symptoms are subject to exacerbations.

2nd Stage. After having suffered acute pain throughout the first stage, the patient becomes suddenly easy, & expresses great satisfaction. Tumour assumes a leaden colour, crackles under the feel, owing to air in the cellular tissue. The abdomen becomes more tense, hiccough more violent, cold sweats, pulse though fuller & softer, is intermittent; patient remains perfectly sensible; death more speedily results.

Post mortem appearances. A quantity of clear serum under the skin; in the sac serum bloody, of a coffee colour, intestine chocolate brown, with here & there a black spot, easily broken. A coat of lymph may be peeled from the intestine, & some

Double trusses - 2 pads & two springs. When the patient bathes he should have a truss covered with oil-skin, for he should by no means be without one when swimming.

The best made trusses chafes at first - interpose a piece of linen, as it generally stops it.

A young person, as a general rule, will have to wear one 2 yrs.; An elderly person, the remainder of his life.

It is advisable to wear the truss at night.

Steel trusses are equally applicable to infants as to adults. One should not be applied before the descent of the testicle.

When a hernia has been cured by adhesion, an accumulation of water sometimes takes place in the old sac: treatment, same as hydrocele.

<u>Irreducible hernia.</u> Causes. 1. Remaining down too long, increasing in size. 2. Membranous bands forming across the sac. 3. The protrusion becoming united by adhesions to the side of the sac.

<u>Dangers.</u> Strangulation, bursting from violence, &c. It also produces much inconvenience.

It might often be reduced, if you could persuade the patient to undergo a course of fasting, accompanied by cathartics, &c, when it arises from the protrusion being encumbered with fat. A more easy method, is to use a bag truss, to lace in front. By gradual pressure in this way by the absorption of the adipose matter, the tumour is diminished & ultimately may be reduced.

Hernia irreducible from the membranous bands across the sac formed in the following manner: While still reducible, inflammation taking place; the parts being then reduced, & the sides of the sac collapsing & adhering. While the adhesions are recent, another hernia pushes through the adhesions & is thus forced down.

They are sometimes rendered irreducible from an hour-glass contraction in the middle of the sac.

From varicocele. Distinguished by its feel, (resembling a bunch of earth worms,) unattended with intestinal obstruction, & by placing the patient in the recumbent posture, & emptying the swelling into the abdomen; then pressing the finger on the ext: ring to prevent any visceral descent, by which the free return of blood by the spermatic veins is obstructed, & the swelling re-appears when no hernia could escape.

Inguinal hernia is most frequent on the right side; because more used.

Causes of hernia. Debility by relaxing parietes, attachment of viscera, &c. is a predisposing cause. Frequent in old age; after fevers; in those who work hard & live on more solid than fluid food. More common in warm climates. It may arise from a fat person becoming suddenly lean: the fat about the cord, &c. being suddenly absorbed, leaves room for viscera to descend. It also arises from hereditary conformation. Often suddenly produced by blows, rupturing the parietes of the abdomen. From: coughing, straining, lifting, costiveness, stricture, viscera becoming too large, external pressure, pregnancy, &c.

Reducible inguinal hernia. A good truss to be used after reduction. The steel should pass from the hernia to about an inch beyond the spine behind. When the pelvis inclines towards the abdomen, the truss will slip from its proper position unless retained by an understrap. If the pelvis is well formed, that is standing out, & the abdomen large, the understrap is not necessary. The truss should be applied over the ext: & int: rings together. When a hernia is reduced, (the patient recumbent,) tell the patient to cough, & the point where it is felt to protrude, towards the spine of the illium, is the point to apply the pad.

In large hernia, &c. the pad must be applied nearer the pubis than ordinarily, because the rings are nearer each other, & from the pressure of the hernia.

Symptoms. Distinction from other diseases.

Distinguished by following marks: — it descends, gradually; it usually protrudes in the erect, & retires in the recumbent posture; dilates upon coughing, or other exertion of abd: muscles; fluctus often felt when intestinal, & it retires with a gurgling noise; when omental it has a doughy feel, is much less elastic, & retires into abdomen slower than intestinal; intestinal accompanied with costiveness, pain across abdomen; omental rarely any disturbance of abd: functions, when reducible; hernia of bladder distinguished by diminution of tumour on the evacuation of the urine.

From hydrocele - By its beginning below, ascending, its transparency, its fluctuation, pyriform shape, involving testicle, want of dilatation from coughing; however if the hydrocele enters the upper part of the scrotum, it sometimes dilates upon coughing, & the only means in its distinction are in its history, & its fluctuation, & transparency.

Hydrocele of cord. Very difficult, unless the hydrocele emerges from the ext: ring, when its transparency indicates its true nature.

Hydrocele & hernia are sometimes combined.

Hydrocele is connected with hernia, in ascites.

From hæmatocele. This is usually the result of a blow, & by the ecchymosis, by its not extending to the inguinal canal, not dilating on coughing, by the bowels being undisturbed, & by its not returning into the abdomen.

Easily distinguished from diseased testicle, by the history, form, distinctness of spermatic cord, want of intestinal obstruction, absence of dilatation on coughing, not returning to abdomen.

Hernia is sometimes complicated with diseased testicle. Very difficult.

Acute inflammation of testicle. Difficult to be distinguished. The tenderness swelling extending up the cord, & vomiting render it liable to be confounded with hernia. The doubt can only be removed, by learning the history, & progress.

may be returned to the abdomen.

Several sacs are sometimes found protruding at the same place.

The sac when protruded is liable to be hurtled by violence.

The protrusions are not always contained in a sac; for, when hernia arises from unnatural apertures in the muscles, these holes are not always covered by peritoneum.

Of Inguinal hernia.

Oblique, taking course of spermatic cord.

Direct, or ventro-inguinal, from abdomen immediately through the ext: abd: ring.

Congenital, protrusion into tunica vaginalis.

Encysted, composed of a bag & protrusion suspended in the tunica vaginalis.

A bag of peritoneum precedes the protrusion, except in injuries, &c., & forms the hernial sac. It adheres by cellular tissue to the surrounding structures.

Oblique Inguinal hernia.

The epigastric artery is situated from 1/4 to 1/2 in. upon inner side of the int: abd: ring.

Origin & course of oblique hernia. First enters upper opening of the abd: canal, being about midway between the ant. sup. spin. of Ilium & the s. pubis, close above Poupart's lig: ; the spermatic cord is behind it, & the epigastric artery to its inner side: when in the canal it is covered anteriorly by ext. oblique, the edges of int: ob: & trans: are above it; the cremaster muscle covers it partially; the fascia transversalis, & tendons of int: ob: & trans: are behind it; Poupart's ligament is below it.

When it emerges at the ext ring, it increases more rapidly, it descends on the fore part of the s: cord to the upper part of the testicle.

Usual contents — Intestine or omentum. In the young, epiplocele is rarely met with, because the omentum only covers the superior abd: viscera.

under glutei muscles.

Perineal. Between bladder & rectum in the male; between the rectum & uterus in female.

Vaginal. Vagina pushed by descent of viscera between rectum & uterus, & pushed backwards by bladder, forming a considerable external tumour when the bladder was full, which disappeared as soon as it was emptied.

Pudendal. Into labium pudendi, passing under ramus ischii with the internal pudendal artery, but continued into the pelvis by the side of the vagina.

Diaphragmatic. By the side of oesophagus, aorta, vena cava, or by innatural openings.

Mesenteric. Passing between the lamina of mesenteric peritoneum.

Mesocolic. Between lamina, or through perforation in mesocolon.

Congenital. Flows cause of testicle within tunica vaginalis testis

Inguin: fem: & umb: most frequent.
Inj: most common in the male; fem: & umb: in female.

Hernia named from contents. — If it contain omentum only, it is called omental hernia, or epiplocele; if intestine only enterocele, or intestinal; if both omentum & intestine, entero-epiplocele; if the stomach is contained it is called, gasterocele; if the liver, hepatocele; if the bladder, cystocele, or hernia cystica; if the uterus, hysterocele; &c.
All contents liable excepting duodenum, pancreas & kidneys.

Viscera most frequently met with — the omentum, & ileum; next in frequency the colon, then the caecum, lastly jejunum; sometimes the appendix vermiformis.

Hernial sac first formed of the peritoneum into which a viscus protrudes. Occasional exceptions.

The peritoneum forming the sac becomes thicker or thinner according to the degree of extension.

When a hernia is allowed to remain a long time it contracts adhesions & cannot be returned. But at first while the tumour is small, although there be a few adhesions, (being weak) it

which time there will be adhesion, sufficient to prevent any risk in removing them, if done carefully.

Should the patient experience shooting pain in the stump, & have other symptoms of suppurative inflammation, apply a light poultice.

If there is any tightness felt at any part from the pressure of the plaster, snip some of the strips on one side.

When the stump is dressed, remove the strips one by one; & if adhesion has not taken place apply ~~them as~~ the old ones are removed.

Should the 1st dressing become very loose, or the stump very painful, dress sooner than mentioned before.

If the ligatures do not come away by the 14th day, gently draw each thread, every time the wound is dressed.

When amputation is required at the upper part of the thigh, the ~~epi-illiac~~ termination of the ext. illiac artery in the femoral is to be compressed upon the edge of the pubes by an assistant, who puts one of his thumbs over the vessel, & the other thumb upon the first.

Hernia.

Inguinal hernia — When it penetrates through the int. abd: ring into the canal, it is called a bubonocele; when it protrudes through the ext: abd: ring it is called a scrotal hernia, or oscheocele.

Femoral, Crural, or merocele. When it protrudes under Poupart's ligament

Umbilical, or exomphalos. When it protrudes at the navel.

Ventral. When it protrudes, through perforations which transmit blood vessels, in parietes of abdomen.

Thyroideal, or obturator. ——

Ischiatic, or ischiatocele. At ischiatic notch, side of sciatic nerve,

Dressing — Integument brought together from side to side, & confined by adhesive straps. Elevate the stump.

Amputation at the hip-joint.

First secure the femoral artery by a ligature at Poupart's ligament. To do it, make an incision 2 in. above the middle of Poupart's ligament, and carry it 2 in. below: lay the femoral artery bare, apply the ligature opposite the ligament, & above the arteria profunda.

Instrument — a long catling. Commence the incision at the lower part of that made to expose the artery, carry it on the inner side of the thigh obliquely downwards, continue it on the outer side below the trochanter major, to the point at which it began.

Make a second incision inclining the edge of the knife obliquely upwards towards the joint, the integuments & muscles being drawn back, those which are inserted into the trochanter should be cut through.

A third incision divides the psoas & iliacus int. & the capsular ligament, when the knee being pushed backwards & outwards, the head is dislocated partly, the round ligament is divided, the head then turns out of the acetabulum.

A last incision passes behind the head, & cuts the remaining muscles, &c.

Branches of the obturator, ischiatic, & gluteal arteries will require to be secured. The sides are brought together, &, if easily, apply adhesive strips only; but if there is any difficulty, use a suture.

It is preferable to sew through the trochanter, if possible.

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Removal of dressings in amputations. Depends a good deal on the feelings of the patient in regard to the stump, & from the appearance of the discharge.

If there is not any unusual pain in the stump, the plasters should not be disturbed for 6 or 7 days, by

blade downwards, so as to form a flap of sufficient size, from the muscles & integuments posteriorly; then divide the integument anteriorly, by making a circular incision, from the point of entrance of the rattling to the point at which it pretended: then complete as in the 1st mode.

3 Double-flap. Made from the outer & inner sides of the limb.

A semicircular incision is made on the outer part of the leg, with the convexity toward the ext. ancle, terminating before & behind; a ~~corresponding~~ incision is made on the inner side commencing & terminating as ~~before~~ the former. The flaps being held back by an assistant, having been dissected up, the operation is finished in the usual manner.

After these operations, tie, the ant. & post. tibials & sometimes the peroneal.

Apply the adhesive straps from side to side.

Position. The limb should be raised, the stump hanging over. The limb should be inclined a little to the outer side.

The single flap is never necessary, except when the integument anteriorly is destroyed.

Amputation above the Knee.

Instruments — a large amputating knife & a saw. Tourniquet applied high enough to allow ample room for the retraction of the parts. Patient on his back. An assistant supports the leg, & another draws up the integument on the upper part of the thigh. A circular incision, at one sweep, 1½ in. above the patella, to avoid the bursa of the rectus; dissect up integuments about 3 in., this is kept reflected by an assistant whilst the superficial muscles are divided close to it; the draws upwards the integument to assist the retraction of these muscles, after which divide the deep-seated muscles & periosteum, then saw the bone.

Tie the femoral artery, branches of the profunda, & others.

Amputation through tarsus. Instrument – A catling.

Apply tourniquet. Separate navicular from the astragalus, & the cuboides from the calcis.

Feel for the projecting process of the navicular on the inner side, cut 3/4 in. beyond it, straight across the dorsum, make 2 small lateral incisions, dissect back the upper flap, divide tendons, cut the ligaments, cut through the articulations, muscles & tendons in the sole, & make an inferior flap.

Same vessels as in last operation.

Sawing through the tarsal bones ~~amputation~~ is a much less dangerous operation.

Amputation of the leg below knee. ~~Instruments – A small amputating knife, a catling, & a saw.~~

3 modes – Circular incision, & single & double flap.

Prefer the 1st – Instruments – a small amputating knife, a small catling, & a saw.

Patient in a recumbent position. Tourniquet applied.

Assistant holds leg at a convenient height: another grasps the leg just below the knee, & keeps the integument upwards.

Commence the incision over the anterior part of tibia, carry the knife around the limb, dissect the integument 2 in. or more & turn it up, the assistant retaining it, cut the superficial muscles, close to the reflected integument, after retraction, divide the deep seated with the interosseous ligament & periosteum with the catling. The knee is then turned inwards, applying the saw first upon the tibia, & when partly divided, act on fibula, & finish both together.

2nd Single flap. – Instruments – a long catling & a saw.

Position of patient & limb same as last. The surgeon feels for the posterior edges of the tibia & fibula, over one of which he places the thumb, on the other the fore finger of his left hand, the palm resting upon the anterior part of the limb; then push the catling through the calf at these points, carry the

the catling under the muscle near the insertion, cut upwards close to the bone, to acromion process; then ~~down~~ the arm ~~down~~ being drawn downwards, pass the catling through the joint bringing it out at the axilla. Secure the axillary artery immediately; small branches of the circumflexi may require tying.

Double flap. 1st incision from below acromion downwards, a little forwards, & passing below the insertion of the latissimus, backwards into the axilla; raise this flap dividing part of the deltoid, & the tendon of latissimus; the anterior incision is begun from the same point carried downwards, forwards below insertion of pectoralis maj: portion, into axilla, to meet the termination of the first incision; raise the flap in part, to expose the capsular ligament, divide, dislocate the head & separate. Secure the artery as before.

After either mode, employ adhesive strips; best applied from before to behind, Take care that they be long enough to keep a firm hold. Operation successful.

Amputation between tarsus & metatarsus.

Instruments — saw & a strong catling. Apply tourniquet.

Leg & foot extended, fixed by an assistant. Commence the incision across the dorsum, ~~at the~~ base of the metatarsal bone of the great toe, & terminate ½ in. beyond the base of little toe; make a lateral incision on each side, dissect up the flaps to joints of the 4 smaller metatarsal bones, & that part of the int. cuneiform which is on a level with these articulations, cut the extensor tendons, bend the 4 small metatarsals downwards, cut their ligamentous connexions, & saw through the int. cuneiform, then cut through, dividing flexor tendons, &c. & make a flap from the sole about equal to the superior.

The ant. tibial or dorsum, & the 2 plantars of the sole, will probably require the ligature.

Keep the integuments in contact with adhesive strips. Support on a pillow. A single flap is sometimes made.

sect back 1½ in.; while an assistant holds it back, cut through the muscles superficially, allow a short time for retraction, then divide the deep seated layer to the bones, cut the muscles & interosseous ligament then saw off the bones. (use little pressure with the saw.) If there are any spicula use the bone nippers. May be performed by making 2 flaps: 1 ant. the other post.

Generally required to tie the Radial, ulnar & the two interosseal arteries. Dressed same as amputation of carpus.

Danger of amputating low down. Inflammation & sloughing of the tendons.

Amputation through the upper arm. Instruments — Catling & saw.

Apply tourniquet sufficiently high.

An assistant extends arm, Surgeon draws up integument with left hand, makes a circular cut 1½ above decannon, dissect up about 2 inches; according to size of arm, then cut the superficial muscles, subsequently the deep seated, cut the periosteum, apply the saw. Generally 3 arteries to be tied: brachial, profunda, & ramus anastomoticus. Bring edges together, apply adhesive strips; the stump supported on a pillow.
If the skin be loose & the muscles flabby, apply a roller to give support. The same steps are taken to perform the operation higher up.

Amputation at Shoulder joint. Instrument — Catling.

Subclavian to be compressed upon the first rib, from above the clavicle, by an assistant, using the key.

Patient seated, arm held by an assistant.

By the single flap. Preferred by Sir A.C. Unless the part is so much diseased as not to allow it, when 2 flaps may be made.
Raise deltoid muscle with fingers & thumb of left hand, insert

tween the fingers; 2 flaps raised, so as to expose the extremity of the metacarpal bone, cut off. Bring the edges of the wound together with adhesive strips.

~~The above manner~~ of amputating, allows the remaining fingers to approximate, there is less deformity, &c.

The toes should be amputated at the joints in preference to the above mode. The recumbent posture is necessary till union is effected.

When all the fingers or toes are so much injured as to require removal, amputate through the metacarpus or metatarsus, instead of through the carpus or tarsus, as the part may be very useful afterwards.

In some cases, if the injury or disease does not extend to all the metacarpal or metatarsal, or the bones, only such as are injured or diseased should be removed.

Amputation through Carpus.

Instruments — Cutting.

Apply the tourniquet. Circular incision just over bases of metacarpal bones, including more integument on back than in palm; dissect up as far as styloid process of radius; an assistant holding back integuments; feel for extremity of styloid process of radius, divide ligaments, pass the knife between the radius & scaphoid, continuing by cutting towards the inner side.

Tie the radial & ulnar arteries. Bring edges together by means of adhesive strips. Support in a sling, or better on a pillow being confined to bed.

The objection to operation between the 1st & 2nd row of carpus, is, the number of joints exposed.

Amputation through Fore-arm.

Instruments — Cutting & Saw.

Apply tourniquet. A circular incision through integument, sufficiently high to avoid the numerous tendons; then dis-

Amputation.

Sometimes necessary. In laceration of limbs; chronic & scrofulous complaints; malignant diseases, &c.

In the thigh the tourniquet is to be placed a little above the middle, where it is nearest the bone; & in the arm, 1/3 of length of os humeri from its head inner side of biceps.

Amputation of fingers. Instrument – a common pointed scalpel.

The finger extended, a circular incision made 1/2 in. beyond the joint, 2 lateral incisions, in the line of the lateral ligaments, & the circular; raise up the flaps from the tendons, then separate the part: the vessels to be tied. Bring flaps together with a slip of adhesive plaster from the dorsal & palmar side, then a circular strip, & a small roller, the pressure of which things will prevent hemorrhage. Support the arm in a sling.

Or, the joint may be flexed, carrying the scalpel through the joint at the dorsal side, & passing it down under the phalanx, so as to form a flap on the palmar side.

These operations are equally applicable to the toes.

Amputation of a whole finger. Instruments – common pointed scalpel, & a metacarpal saw. Finger extended & separated from the others, 2 incisions made, meeting at an angle over the dorsum of the metacarpal bone, a short distance below the digital extremity, terminating on each side at the natural separation of the fingers; 2 other incisions are made in the same way on the palmar side, joining the others between the fingers; the scalpel is then to be passed on each side of the metacarpal bone, separating it from its lateral connexions; the tendons are then divided; then the blade of the metacarpal saw is to be introduced between the bones, & the extremity sawed off.

The edges of the wound are to be brought in contact, & binding the fingers on each side together. Support arm in a sling.

In amputating the fore or little finger, only 2 external incisions are required, extending obliquely over the joint, & meeting be-

at successive & distant periods.

Where there is a fissure on each side through the bone with the double lace-lip, the insulated portion projects in front, this may be diminished by gentle pressure, after the union of the lip.

Cancer Labii.

It commences either in the form of a warty excrescence, or an ulcerated fissure attended with surrounding hardness.
Nearly always found on the lower lip. Sir A.C. never saw but one on the upper lip; 200 on the under.

As a wart. It is covered by an incrustation, on removal another will be formed. Additional growths take place in some parts, ulceration in others; when the incrustation is now removed, the surface freely bleeds, luxuriant granulations appear in some parts & depression in others. It is not very tender to the touch; it is occasionally accompanied with darting pains.
As a fissure. – an incrustation is produced, &c. as above.

The edges of the ulcer become everted, &c. glands become affected &c.

Treatment. Removal by knife – should not be done if a gland under the jaw is affected.
Operation. A triangular piece taken out, including the disease, take care to cut in the sound parts.
The arteries do not need a ligature, unless the artery is very large.
Three sutures are required to bring the edges together. Some pressure is necessary to be employed afterwards to stop hemorrhage; it may be done by the patient with a sponge.
~~Ligatures~~ removed on the 4th & 5th days.

Aura Epileptica.

Sir A. C. cured a case, which extended up the course of the radial nerve, & also side of the neck; accompanied with pain, rotary motion of the arm inwards, occasional loss of sense & volition, &c, by removing a portion of the radial nerve (5/8 in.) at the wrist.

flammation. Symptoms. – Those of pleuritis – viz. pain, cough, dyspnoea, rigors, &c. A swelling of legs succeeds from pressure affecting the free circulation through lungs, &c.

The pus sometimes escapes spontaneously.

Paracentesis. – Make puncture to the side of thorax, about the 8th rib.

Draw up the skin, make an incision upon the upper edge of the rib; divide the intercostal muscles carefully, then use the canula. When the matter has been evacuated, remove the canula, let go the skin, & the int. & ext. wounds are no longer opposite to each other.

This operation is frequently unsuccessful.

When collection of pus is circumscribed in the pleura, & existing adhesions – it is called spurious empyema. Treatment. That of the common abscess; viz. fomentations & poultices; & the pus is to be left to ~~nature alone~~ & art, as the constitution is able to bear the ulceration.

Hare-lip.

A congenital fissure – sometimes extending from edge of lip to nostril, others enter the nostril, sometimes exists on both sides, & may extend into each nostril. It may also extend into the palate processes of the max: & pal: bones, & through the velum. A double fissure, one on each side may extend in the same way.

Time for operating. Prior to 6 mos. danger of want of union, & even loss of life; from 6 mos. to 2 yrs., during dentition should not be performed; after 2 yrs., or dentition is completed, there is little risk of failure.

The arteries do not require the ligature, the pressure of the edges together is sufficient to stop hemorrhage.

As a general rule the upper ~~suture~~ sutures may be removed on the 4th day, & the inferior upon the fifth. But if there be much inflammation or suppurative tendency, both should be removed on the 4th day.

It is of no use to apply anything after the removal of the sutures, unless the adhesion is incomplete, when an adhesive strip may be applied.

The child should take food in such a manner as not to disturb or moisten the lip.

A fissure in the bone makes no difference in the performance of the operation.

Double hare-lip is performed in the same manner, but one fissure

that one sac is formed. The appearance of the fluid varies, in colour, consistence, &c. Quantity – Average from 25 to 32 pts.
~~At~~ The sac ~~adhesion~~ is either formed internally or externally to the tunica albuginea.
At first the bag does not adhere to the peritoneal lining of the abdomen; but as it becomes large, it gradually acquires such adhesion.
Sometimes bursts by accident.
Pregnancy retards the disease.

Paracentesis.

Should not be performed early in the disease. Not till, respiration, &c. become impeded by the pressure.
If the quantity be small in ascites, if you operate, you may wound important viscera. In ovarian dropsy the sac will not have as yet adhered to the parietes of the abdomen, & also it may consist of several sacs, as before mentioned.
In cases of doubt (although there be fluctuation;) in the female, examine if she be not with child.

A long trocar & canula are necessary in ovarian dropsy.
Place of operation 1 in. below umbilicus.
If there is any interruption to the passage of the fluid by the pressure of the omentum, &c, pass a probe gently through the canula to remove the obstruction.
The operation rarely produces a permanent cure.

Not Sir A.C. (Some recommend the leaving of the canula in the wound, a slight inflammation sometimes succeeds; & by the change of action produced in the vessels, the disposition to a further secretion is lessened, & in this way a cure is produced.)

Apply pressure immediately after the operation, to prevent re-accumulation, by lessening the determination of blood to the parts.

Empyema.

Paracentesis.
Not performed for collections of water in chest.

Empyema – a collection of matter in the chest, from in-

Ascites.

Peritoneal dropsy. Symptoms. An unnatural sense of fulness after taking food; next, an increase of lower part of abdomen; there is tension; fluctuation when in the sitting posture. Little if any pain; inconvenience from distension. Secretion of urine scanty. Swelling of the legs take place. Sometimes the omentum is thickened so as to render fluctuation indistinct; & sometimes in tapping it stops the fluid from escaping. Quantity of fluid - usually from 25 to 30 pints. It is serous.

Cause. Frequently produced mechanically from disease of the liver; also from other viscera; diseased glands, &c. It is frequently the effect of disease in the chest, &c.

Treatment. If from the liver; the cause must be first removed, calomel, hydragogues, &c. Elaterium is a powerful remedy. If the accumulation be so considerable as to impede breathing - operate. When it arises from organic disease &c. the relief is only temporary; but when it is the effect of a constitutional disease, or some functional chage, it is frequently followed by a cure.
Perforce after the operation lessens the disposition to a return.

Ovarian or Encysted dropsy. A bladder of water, formed within or upon the ovarium.
Symptoms. At first, swelling upon the brim of pelvis. No pain. It is confined to one side, above Poupart's ligament; general health unaltered. As it increases, it rises from the lower portion of the abdomen & gradually extending over it, losing the circumscribed form. Fluctuation not so distinct as in ascites.
The ovarium is subject to solid enlargements of a considerable size, & might be taken for ovarian dropsy, if the attention be not directed to the fluctuation. At first the water is contained in several bags, but afterwards the septa become absorbed, so

Cancerous polypus. a disease of age. Symptoms. obstruction of breathing, bearing pangs, the pain extending to the different branches of the 5th pair of nerves. Its growth is slow; at length it ulcerates & discharges a bloody serum. Colour purple; its feel firm. It sometimes bleeds freely. It sloughs; it affects the surrounding parts; the face is disfigured; portions of the bones are absorbed, It gradually destroys life. Narcotics are the only medicines that palliate the patients disease.

The fungoid polypus. Occurs at all periods. It is of a dark colour, discharges a fluid; little pain, general health at first little affected. It extends, there are frequent hemorrhages. The patient dies from nervous irritation, &c.

Polypus excrescences have been removed in the larynx by ligature.

" in the rectum. It is of a red colour, looks like a leech or an earth worm. Removed by ligature.

Fungoid polypus of rectum. Rare. Fatal.

Enlarged Tonsils.

Frequent from common angina. Use antiphlogistics. If the gland suppurates, the pain is severe. The fluctuation may be felt by the finger. Use fomentations & poultices. But if there is much swelling, pain, &c. puncture the gland. Chronic enlargement, treated by excision.

Elongation of Uvula.

Use astringent gargles, if they will not do, a portion of it may be clipped off.

Diet. Animal food is better than vegitable, as occupying less bulk to afford the same degree of sustenance. Avoid flatulent food. Exercise necessary. When the piles bleed use inj: ratanhiæ mag: sulph:; inject cold water.

They often occasion prolapsus ani; the ~~patient feels~~ piles causing a sensation of feces, which the patient tries to expell, the rectum is evolted.

It should be washed with a solution of alum & oak bark, & it should be returned by a piece of linen dipped in oil, or covered with cerat: cetac:.

Puncturing the piles often relieves them. The only permanent cure is a operation. See Gibson's Surg:

Polypus of the Nose.

The common pendulous polypus. Symptoms, occasional obstruction being increased in damp weather.

On looking into the nose a jelly like appearance is seen. It grows from the membrane, on the side, on which the turbinated bones are placed. It may be removed by tearing it away, with a portion of the mucous membrane, by a pair of forceps. No serious hemorrhage results. As it is liable to return, use alum injections; lime water with lead: acetat:. Sir A. C. recommends, removal by excision with a pair of scissors with curved extremities. If the polypus hang at the posterior nares, take hold of it with the fingers, behind the velum, & excise from the nostrils.

An elongation of the pituitary membrane sometimes takes place, from relaxed constitution, it is frequently taken for polypus. Use alteratives, & apply astringent injections.

Hydatid polypus. Resemble wetted bladders; when pressed they burst. By increasing they deform the nose. Removed by the use of a strong solution of alum or lint constantly worn; or by the daily application of Muriate of antim: by a dossil of lint through a canula. The first mode is preferable, though it takes longer. Does not say decidedly that the disease will not return.

to not operate where connected with bad phthisis, as it will not get well.

Treatment. Medical. Restore the secretions from the liver, &c. by Hyd: tonics, rhubarb & soda, &c. Any disease of some organ must be first cured before an operation is performed. The patient's strength must also be restored. Local. When there is a tumor near the anus, threatening the production of an abscess, & the health be good: apply leeches - cooling lotions. Give a mild aperient, but no drastics, as they will increase irritation.

If the swelling increases, apply fomentations & poultices. Open as soon as fluctuation is perceived. Let the wound heal itself if possible. It will not generally heal. Treatment. Operate. Afterwards, put dry lint into the wound & compress the part untill all bleeding stops. The following morning apply a poultice, & in 2 or 3 days the lint will separate. Pass a probe into the wound often, to prevent union of the sides for 5 or 6 days, & continue to poultice; but then when granulations arise, introduce lint, & prevent their inoculation, untill gradually granulating, the cavity becomes filled. If the sore is indolent, occasionally purge, give Confect: pepper.; apply lint dipped in a sol: Sulph: cupri, or spread with the Ung: hyd: Nit: Oxyd:

Some cases have been cured by injection. (Hyd: bichlor: - gij to Aq: Calcis ℥j.

The Seton has been sometimes successfully employed.

Hæmorrhoids.

There are two states, viz. a varicose enlargement of a vein; or an excrescence arising from its adhesion & organization.

~~The operation~~ If a patient applies with an external piles, use aperients. Apply leeches, & lead water. When the inflammation is subdued, & if the vein remains enlarged & hardened, puncture & let out a clot of blood which it contains. If it suppurate use fomentations & poultices. The excrescences left by external piles may be clipped off, with a tenaculum & scissors.

Internal piles. An aperient - conf: Senna cum Sulphate; bals: capai:, is also good; if there is hepatic congestion = gentle doses of blue pills. If piles arise from diarrhoea use conf: opii. Local - to prevent increase, inject cold water twice per diem; or alum water; or a decoction Quercus.

the part ulcerates, the surrounding parts harden & swell. Other warts form, so that the ulcers become numerous, phymosis takes place from the cicatrization. The passage of urine is impeded; apertures form from the urethra through the skin of the penis; accompanied with pain hemorrhage occasionally occurs; When the inguinal glands become affected the disease is incurable.

Frequent cause. Natural phymosis, confining the irritating secretions of the glandula odorifera. &c.

Medicines are of no service. To tranquilize the parts, poultices, & soothing ointments may be used.

Operation. Draw forward & elongate the penis. Tie a piece of narrow tape tight around it at the pubes. Make a direct cut, behind the disease, without any attention to preserve integument. Then tie a piece of tape tightly around the remaining part, & make pressure on it, & there is no necessity for securing vessels.

When the bleeding has stopped, remove the tape & apply lint upon the wound. In a few hours the necessity of urinating will remove the dressings; & when the danger of bleeding has ceased, apply a poultice, as the best means of promoting granulation.

When the surface begins to granulate, a piece of bougie should be constantly worn.

Fistula in Ano.

An abscess of the cellular membrane, near the rectum, producing an aperture into the rectum, or of the side of the anus.

Difficult to heal because of the action of the muscles, destroying the union of granulations.

Symptoms. Pain near anus; hardness; tenesmus; throbbing & darting pain in the rectum & on the diseased side of the nates. A fluctuation is perceived; if left to nature, the abscess breaks into the rectum, or externally near the anus, sometimes in the perineum, or the nates. The matter discharged is excessively putrid.

Causes. Sometimes piles; distant visceral complaints; violence; obstinate costiveness with indurated stools, giving rise to inflammation; &c. Most common cause is disease of the liver, preventing the free return of blood inflammation takes place, &c. It arises from nearly the same causes in disease of the lungs. It is often connected with phthisis.

From whatever cause retention be produced, the bladder must be relieved, or the patient will die from inflammation or gangrene, or from irritation.

If, therefore, a catheter cannot be introduced; if relaxation by bleeding, the warm bath, & antimony; holding the patient by opium, do not succeed in giving a passage to the water, an operation will be required.

The bladder may be punctured above the pubes; by the rectum; See Gibbons Surgery, Vol. II; P. 2. or by the perineum.
Sir A. C. "says" he never saw a case of stricture from enlargement of the prostate, in which he could not pass the catheter, of a proper form & size.
The operation which he prefers, is to open the urethra only, & not to puncture the bladder, which "he says" is scarcely ever necessary.
This performed; by passing a catheter or a staff to the stricture, & directed by its point in making the incision, cut it an inch behind, & in a line with the point of the director. Sometimes he introduced a female catheter into the urethra through the wound, to prevent extravasation, but it is not absolutely necessary.

Retention in the female. — Operation Rarely required. The operation above the pubes is preferable to all others.

Amputation of the Penis.

Occasionally required for a cancerous state. The disease sometimes commences upon the prepuce & sometimes upon the glans.

Symptoms. Upon the prepuce, it begins as a pimple surrounded by a hard base; it ulcerates slowly & discharges a bloody serum, occasionally with pus. At first there is only slight irritation; & after a time, sharp darting pains; the glands of groin become affected. A phymosis is produced; the disease extends. Cut away the affected prepuce, by a circular incision, tie the vessels, & apply a poultice.

When it commences in the glans, — it is in the form of a wart usually, attended with considerable irritation, & a discharge of serous fluid.

a stone; sometimes felt by the finger per rectum. Treatment. Removal by operation. The same steps taken as in lithotomy, as far as making the incision through the tube of the prostate; then extracted.
They are composed of phosphate of lime.

Calculus in the female.

Symptoms.- Suffering more severe than those of the male. In addition to the symptoms before mentioned, there is a suffering after the discharge of urine, from the bearing down of the bladder, uterus, & rectum, with a sensation of their being forced through the lower opening of the pelvis. The retention of urine becomes imperfect, the person is always wet, & smells offensively.
Treatment, Dilation of the meatus will often suffice, with a tent, or an instrument; (the dilating forceps). For performing the operation See Gibson's Surgery. Vol. II.; P. 233.

Calculi.- Sometimes form in the duct of the sub-maxillary gland. Remove them.

Operations for Retention of Urine.

Causes.

In the male.
1. Narrow orifice to the urethra.
2. Congenital obstruction.
3. Permanent stricture.
4. Inflammatory ———.
5. Spasmodic ———.
6. Abscess, a tumour pressing upon the urethra.
7. Stone in the urethra.
8. Enlargement of prostrate.
9. Paralysis of bladder.
10. Chancres, &c. in urethra, which in healing close it.

In the female.
1. Polypus of vagina.
2. ——— of uterus.
3. Ovarian enlargement.
4. Retroversion of uterus.
5. Loss of power from uterine affection, a species of hysteria

incontinence of urine; & an interruption to the passage of semen, are 2 evils which have arisen from this operation.

Calculi in the Urethra.

They may be present in 3 situations: 1, in the membranous part of urethra; 2, above scrotum; 3, opposite pubes.

When in membranous portion. – Symptoms. – The patient having a strong desire to void urine; but only able to pass a few drops, with dreadful agony. When you introduce a catheter ~~you~~ & feel it grate against a stone, withdraw it, & introduce a bougie as large as the passage will admit, to the stone; allow it to remain; then the patient to sit in water as hot as he can bear it, & continue sometime: give opium ~~with~~ with small doses tart: antim:. In half a a whole hour, withdraw the bougie, whilst the patient tries to make water, when the stone will frequently follow the bougie.

If the stone is permanently lodged, pass a catheter down, & introduce the finger into the rectum, to press upon the canal behind the stone, so as to prevent any retrograde motion; then make an incision in perinæo upon the calculus, & extract it with the common dressing forceps.

Scrotum. If above the scrotum try to press it forwards with the fingers; if you cannot push it behind the scrotum, & then cut upon it, if the above treatment will not do. Do not cut through the scrotum; if it is ever necessary, let the ext: opening be free. A catheter should be introduced into the bladder & left there while the wound heals.

Glans. When near try & press it out, by a bent probe to pull it out. Rather than risk a laceration, enlarge the meatus with a lancet.

Calculi in Prostrate Gland.

May be placed in the ducts, or in a cyst in the substance of the gland. Sir A.C. never saw any larger than a pea. Their number is sometimes considerable. The cases are of rare occurence.

Symptoms. Very obscure – Great irritation in the part. In passing an instrument through the urethra, it has been felt, in cases, to grate on

Calomel purges, apply fomentations, leeches, & blisters to the abdomen; bleed from arm, & use the warm bath.

Gangrene of Scrotum. In very old persons, or in intemperate persons.

Extravasation of Urine. into scrotum; it arises from the incision being made too high.

After the operation of lithotomy, the scrotum should be always supported by a bandage, to prevent the urine which flows through the wound, from irritating it

Ulcerated state of the bladder.

Diseased Kidney.

Visceral disease.

The After-treatment. The patient is unbound; but the legs should not be immediately brought together if any bleeding continue, as the blood is apt to pass back into the bladder, where it coagulates; producing urgency to make water, the coagulum is forced out, & the hemorrhage renewed.

Keep the patient dry.

If the patient be irritable give opium with an aperient.

At first give the patient diluent vegitable drinks; & when the danger of inflammation is passed, animal broths, &c.

Saline medicines with excess of alkali, are useful; if there is a tending to fever & inflammation, give castor oil, & foment the abdomen; if it increases, calomel & antimony; if the pain in abd. becomes severe bleed in the adult, apply leeches in children.

When the wound begins to granulate, tie the legs together; not before.

It is not necessary for a patient to remain on his back continually; he may turn on the side.

It is better to allow the urine to pass through the wound, than through the urethra, there is less irritation if it escape easily by the wound. In enlarged prostrate, a flexible catheter must be introduced by the urethra, to permit the urine constantly to flow off.

Children usually recover in 3 weeks; Adults 1 month.

The patient should be first sounded with the bladder full; & if the stone cannot be felt, have it empty, & sound again. First sounded in the recumbent position, if not felt, in the erect.

The staff should be held in such a manner that its groove may be slightly inclined to the left side of the raphe.

The surgeon should never leave the patient while there is any hemorrhage.

The forceps should be very gently guided in, & gradually brought out. More unsuccessful cases have arisen from the violence with the forceps, than from any other part.

The operation consists, in opening the membranous portion of the urethra, dividing the transverse perinei muscles on the left side, & exposing the groove of the staff — with the knife; then dividing the left half of the prostate gland horizontally, & that portion of the bladder connected with it, by means of the gorget; in introducing the forceps, seizing the stone & extracting.

If stricture exist, do not operate untill it will admit a large staff.

An enlarged prostate offers great difficulties, if the stone is large, often causing the patients death, from the violence almost necessarily used to extract the stone. It is fortunate if the stone is broken.

A lateral enlargement produces less difficulty, if it be freely divided.

The enlarged prostate by occasioning a sac behind it, in which the stone is principally lodged causes some difficulty; in this case the curved forceps are required, & the finger must be passed up the rectum, to raise the stone from its situation.

When a patient has been subject to perineal anus, it should be supported during the operation by an assistant.

Causes of death as a result. Nervous irritability in young persons, they are generally pale & comatose; the the following day they are restless, weak, are convulsed & expire. To relieve irritability use calomel & opium

Peritoneal inflammation, from violence in extracting the stone. Symptoms. vomiting, tenderness in region of bladder, tension of abdomen & difficulty in procuring motions. Treatment

destroyed. The patient in this disease walks with great care; & also lies down with great caution – to avoid irritation.
The pain is not more severe from a large than a small stone.
The removal of a number of small stones is not so dangerous, as the removal of one large stone.
In the extraction of one stone, if a smooth surface be seen as if produced by friction, you may suspect the existence of another.

Composition of Urinary Calculi.

1. Lithic, or Uric acid calculus. With nitric acid – forms purpuric acid & ammonia.
2. Lithate, or Urate of Ammonia – Ammonia disengaged on adding a caustic fixed alkali.
3. Phosphate of lime.
4. Triple phosphate, or phosphate Magn: & ammon: Soluble in dilute acids.
5. Oxalate of lime, or mulberry calculus.
6. Cystic oxide. & others

Treatment. Alkalies may lessen suffering, if with these attention to diet & general health. Diluents are useful. After the removal of a stone, a medical treatment, & attention to diet should be adopted.

Lithotomy. If the liver be diseased; or the chest be affected; or the heart have an irregular action, the patient does not in general recover from the operation. Pain in the loins, vomiting, or the discharge of matter, indicating disease of the kidneys, also form insuperable objections to the operation. Do not operate where there is much functional or any organic disease. Sir A. C. inquires of the patient whether he could take exercise if the stone was removed, whether his digestion good; & the breathing free.
60 yrs. is the period when it is most frequent, & then the operation is very successful. Fat persons do not generally bear operations well, they have little vital power, they should be reduced by diet & medicine, & they must be accustomed to irritation of the bladder, by the frequent introduction of the sound.
The most favourable age is from 8 to 20. Under 2 yrs. children often become convulsed & die.
Prior to the operation, in addition to purgatives, &c. use an enema to empty the rectum, &c.

Stone in the Ureter.

Symptoms – pain felt near ant. disp. Spine, pubes, & in the direction of the psoas muscle, if pressure be made; as the stone descends, under alternate repels, spasmodic contractions of the cremaster muscle occur. Patient is sick often vomits. The pain has remissions till it reaches the bladder when it ceases entirely. Sometimes the stone being detained in the ureter, the matter ~~&c~~ urine collecting, the ureter gives way, & the matter is effused into the abdomen, & death results.

Treatment. If the pain is very severe, bleed freely, to produce relaxation of the ureter, put him in a warm bath. Give opium & liquor potassæ, to allay irritability; foment the abdomen, & gently rub it down in the course of the ureter to assist the passage of the stone mechanically.

—,—

Stone in the bladder.

Symptoms.– As said above when the stone falls into the bladder the pain ceases in the parts; but he experiences acute pain along the urethra, particularly opposite to the prostrum. The pain varies according to irritability of patient, ~~figure or roughness~~ of the calculus, &c. Relief is experienced by pressing the glans & elongating the prepuce; under severe suffering, after passing urine, cross their legs, & press on the genitals with great force.

The adult, when voiding his urine, often rests his head against the wall, & bends his knees, & relaxes the muscles generally.

The pain is felt more after the discharge of the urine, because of the contracting of the bladder around the stone.

Frequently the fæces pass at the same time with the urine, & a prolapsus ani is common, in consequence of inordinate action of the muscles. Violent spasm of the abdominal muscles sometimes takes place, after the discharge of urine.

The bladder is very irritable, capable of retaining little urine, & becomes diminished in size.

On the discharge of the urine, a sudden stop with pain is produced often. Patients therefore, pass their urine best when recumbent, as the stone does not fall over the entrance.

After the disease has advanced, on exercise, bloody urine ~~&c~~ is often discharged. As the disease increases, the bladder becomes more irritable, mucous is discharged with the urine, This state is often attended with rigors, succeeded by heat, matter is sometimes discharged, the mucous membrane results, & the patient is gradually

Fungous tumour of the Mammilla.

Rare. Symptoms. Globular swelling behind nipple; not so hard as scirrhus, becoming softer as it increases; free from pain.
Treatment. Extirpation. Not much account given by Sir A. C. Hee only saw 3 cases. They were all males. On dissection they were found to be more spongy than scirrhus. Two of the patients entirely recovered, the third died from another disorder.

On Urinary Calculi.

They may be seated in the kidney, ureter, bladder, & in the urethra.
The calculi found in the ducts of the prostrate gland are not urinary.

Renal, or Kidney calculus.

Symptoms. An obtuse pain in the loins, extending forwards towards the navel, sense of numbness in bowels. Vomiting is often produced, by the stomach sympathizing. The loin is exceedingly tender to pressure. The act of stooping produces acute pain, & is sometimes followed by a discharge of bloody urine.
It is sometimes removed by ulceration taking place in the loins. If the calculus cannot readily pass, the operation may be dilated by a sponge tent; if this fails, a bistory may be carefully used, as the vein & artery are before the stone.
The kidney is sometimes not & at others much enlarged. If the stone interrupts the passage of urine, the internal structure becomes absorbed, the membranous sacs & capsule of the kidney only remaining.
Sometimes ulceration is produced: the kidney enlarges, matters, gradually becoming absorbed; matter is discharged with the urine; high constitutional irritation results; & if both kidneys are affected, death results.
Treatment. Medical. The liquor potassæ; carb: potass: or soda; they prevent the formation of uric acid: they also deaden the sensibility of the organ. If much pain be felt in the loins, a purgative should be given daily, cupping occasionally, or the application of a blister to the loins will be useful. If there be a suppurative discharge, an issue should be made in the lumbar region.

The breasts sometimes become enormously enlarged, from increase of structure. Treatment. A suspensory bandage. Give Hydr: cum creta with rhubarb & soda.

The Milk abscess. — Treatment. Same as other abscesses. When the constitution & patient suffer severely & the abscess is slow to break, it is right to assist nature with the lancet; or, when the abscess forms deeply, at the back of the breast.
When they ulcerate, sinuses, difficult to heal, are sometimes produced; & the best treatment is to inject with a solution of Zinc, or diluted Sulph: acid, & to apply it over the breast constantly by linen.

On the areolar, or Mammillary tumour.

Children generally from the age of 7 yrs. to that of puberty, are not unfrequently subject to a swelling behind the mammilla, or nipple. An inch or more in diameter; first led to the observance by a feeling of uneasiness, generally tender to the touch; feely moveable; generally found in irritable young persons; more frequent in the male. It is never productive of any serious disease. Under the influence of mercury & sarsaparilla, &c. it becomes absorbed in a few months. Evaporating lotions may be applied.

Scirrhous of the Mammilla.

Swelling at root of nipple; hard; somewhat irregular on surface; at first free from pain, but as it increases a lancinating pain is felt. A slight ulceration takes place, upon the surface a yellowish-brown incrustation ~~forms, & this~~ separates, the ulceration increases, another crust forms, the nipple is destroyed, the ulceration continues till it occupies a considerable space; as the disease increases the pain increases, but there is hardly any tenderness on touching it; the sore frequently bleeds; the glands become affected, &c.
Treatment. Removal by the knife necessary.
If the disease is beyond the reach of surgery, use soothing applications, narcotics, &c.

extremely tender to the touch, often remaining sometime after. The uneasiness extends to the shoulder & axilla, down the arm. It is increased prior to menstruation, & decreases after its cessation.

The pain is sometimes severe as to cause the stomach to sympathize, & vomiting is produced. The skin is undiscoloured. The constitution is highly irritable & sensitive, the hair of the patient usually light, complexion very delicate, temperament sanguine.

It may continue for months & years. Not malignant. An operation unjustifiable.

The disease is frequently accompanied with amenorrhoea, a great paucity of menstruation, & paleness of the colour, & frequently attended with profuse fluor albus.

Cause. Irritability of constitution, defect of uterine secretion, & often its immediate exciting cause is a blow.

Treatment. To diminish irritability locally - apply belladonna, or opium; extr. conii; or recent conium in poultice, &c. A plaster of soap cerate, application of fur, or oiled silk are found to be useful.

When the pain is excessive, & the blood vessels full, apply leeches. If too frequently used, the debilitate & increase irritability.

Constitutionally. - To diminish irritability, to restore defective secretion, giving tone to the system.

Medicines. Hydr. c. opii, combined with an aperient; mist myrh cum ferro; rhubarb & soda; tonics, &c.

—"—

Uterine tumours have been known to take place.

—"—

Lacteal tumour.

—"—

Takes place sometimes after delivery, attended with painful distension, but without discolouration. The veins are very large. On putting a lancet into the tumour milk is discharged.

Cause. Obstruction of one of the lactiferous tubes.

Treatment. Leaving the hole remain open, which was made by the lancet to discharge the milk secreted in that part of the breast. The swelling gradually subsides as the milk in the breast disappears.

—"—

The disease is certainly founded in a constitutional change, & in a specific local action.
The first is to be destroyed by alteratives = Hydr.; bitter infusions; sarsaparilla; iodine; &c.
Aluminous applications, or hydr. perox. prevent the growth of fungus.

The operation. It less frequently returns than scirrhous. Take care to extend the operation into the sound parts.
Afterwards pursue an alterative treatment.

Simple Chronic Tumor of the breast.

Not malignant, nor is it dangerous. Generally attacks the young; usually between the age of puberty & 30 yrs.
Symptoms — Swelling very superficial. As it increases, it becomes in some degree lost in the substance of the breast. It is not hard as the scirrhous; not the loss of health of the fungoid disease. Extreme moveable swelling. Generally no pain. It grows slowly & gradually, not often becoming very large.
Diagnosis. The youth of patient; absence of pain; appearance of general health slow growth, & superficial situation of swelling; extreme mobility; a conglomerate feel of the tumor; axillary glands free from disease.
Dissection. Appearance of sweet bread. Cause. Unknown.
Treatment. Little done by medicine. Might use alteratives.
If the disease increases, it may be removed. No fear of return. Secure each vessel which continues to bleed.

Adipose Tumors.

A fatty swelling is sometimes formed in the breast. It may be removed if the patient wishes it. No harm results in leaving it remain.

Irritable Tumors in the breast.

Generally occurs in young women from the age of 15 to 30. Swelling never acquires magnitude.
Symptoms. A lobe slightly swollen;

ustured, which did not bleed during the operation.
In dressing the wound put a suture in the centre. And then apply adhesive strips: composed of the emp: thuris comp: & emp: sap: aa.
If erysipelas should arise, apply flour or starch.
Support the arm in a sling. The ligatures may be drawn away in 7 or 8 days.
After the patient has recovered from the operation, pursue a medical alterative treatment.

—.—

Fungous or Medullary tubercle.

Occurs more frequent after than before 30 yrs. of age.

Symptoms.— Not so hard as scirrhus; & as it increases it becomes yielding under pressure. The skin is of the natural colour, while the tubercle is in the adhesive stage; but, after a few months the skin becomes livid, & then a distinct fluctuation can be perceived. The veins of the surrounding skin become enlarged & varicose, & the surface assumes a deeper colour than inflammation. The cyst ulcerates, discharging a fluid resembling bile. A fungous sprouts, occasionally bleeding profusely, but is easily stopped by pressure; the discharge is excessive, having a very disagreeable odour; the edges become coarted; the tumour manifests a sloughing disposition. From the discharges, &c. the patient generally is hurried into the grave in a few months; much sooner than in scirrhous.
This disease in the first stages is not painful, nor is it ever so painful as scirrhus. The axillary glands are not usually affected. The nipple is not generally drawn in, nor is the skin puckered.
Diagnosis.— Distinguished from scirrhus by a less circumscribed & more diffused inflammation; less hardness; the formation of a cyst; extreme varicose state of veins; the fungous which sprouts after ulceration; by profuse bleeding; extensive sloughing; less pain; absence of retraction of the nipple; want of puckering of the skin; & the glands less affected.
The health is at first unaffected, but when ulceration, & discharges take place, she becomes emaciated, &c.

Dissection. The tumour in the adhesive stage appears lobulated; is compact, &c. In the next stage it forms a cyst. When a fungous exists, it has the appearance of soft organized matter.

Predisposing causes— Anxiety of mind, &c.

Cause — Supposed to be caused by worms; probably so in a faulty constitution, but not in a good one. Doubtful.
Anxiety of mind; suppressed secretions, &c. are predisposing influences.

Treatment. — No Medical cure. Lessen any inflammatory action. Support the secretions — calomel with inf. gentian, Rhubarb & soda is an excellent medicine. Iron not recommended unless the uterine secretion diminishes, because it often occasions feverishness. In the last mentioned case, Kill: cal: comp: is useful & Vin: ferri; carb: ammon: twice per diem. Opiates must be given to relieve pain. Also stramonium, belladonna, &c. If there is cough, & dyspnoea, a little blood might be taken — 6 oz.—.
Change of climate has little effect on the disease. Low living only makes the patient more irritable, & worse. Vegitable diet has not the least benefit. Stimulant drinks are pernicious.
Local treatment. Subdue inflammatory action; by diaphoretics, wearing oiled silk; soap cerate, or a poultice of bread & puffy water; wearing a piece of fur upon the part is found to tranquilize it.
As the pain is occasionally severe, & the disease seems to grow by occasional determinations of blood, leeches may be applied (No 6), but not too often.
If the pain is very severe belladonna may be applied locally.
If there be a disposition to suppurative inflammation, it is right to use fomentations & poultices.
When the part is ulcerated, ung: bismuthi } ung: Zinc: Oxi; or chalk & opium are useful.
If the sore is very painful — apply a powder 2 times a day — ℞ Cinch: pulv: ʒj — Opii ʒj — M.
If there is a disposition to slough use the carbol carbol poultice, or the nitric acid lotion.
When the arm swells in the latter stage, apply a roller from hand to axilla, & keep arm from the side, to allow as much freedom as possible to circulation & absorption.
The Operation. It should only be removed when the glands of the axillae are not affected. Do not give the patient false hopes, state the case truly.
When to removal, any affected gland are seen they should be removed. After the operation the vessels should be carefully secured, as ~~the~~ vessels bleed often when action & warmth are

The swelling gradually increases, till it becomes 2 or 3 in. in diameter; it rarely increases to a great bulk. Next the nipple is retracted; frequently it becomes inflamed; the skin becomes puckered so as to resemble a cicatrix. Frequently the follicles of the skin are filled with black sebaceous matter. The lymphatic glands become affected.

It may exist years without destroying life, & it even often destroys without further change; but it frequently proceeds to suppuration: the skin becomes livid red; severe pain; sensation of yielding; ulcerates discharging bloody serum; fungus cannot be formed on this malignant surface. The surface of the sore feels hard; remarkably insensible to pressure; the granulations which spring up are insensible, secreting a bloody serum. The ulcer frequently bleeds, relieving the patient suffering a short time. The edges become everted; the ulceration gradually proceeds, extensive & deep; pain is felt in various parts of the body; dyspnoea; cough without expectoration. Spasms, often attended with vomiting, probably arising from a tuberculated state of the liver. Complexion sallow, with now & then a slight flush upon the cheek; swelling of the arm begins to take place. The constitution irritated by the swelling, the pain, &c. Death.

<u>Dissection</u>. A solid mass; the lactiferous tubes seen as white lines; &c. The glands of axilla, chest, &c. are affected. Scirrhous tubercles are often found in the pleura; liver; the uterus is rarely free from disease; the ovaries sometimes; the bones, sometimes, near the part.

Generally takes place between the ages of 30 & 70 yrs.

It is often confounded with chronic enlargement.

When it occurs in very old persons, it does not generally shorten life.

The disease is supposed to occur more particularly at the cessation of the menstrual secretion: many exceptions.

More frequent in unmarried women, & those having no children, who are married.

In some instances hereditary. Therefore in a family in which one is affected, the first dawn of the disease, & the general health should be attended to.

As it increases, part of it becomes fluctuating, part remaining solid; upon puncturing a fluid like serum, is discharged; the cyst sinks, but soon becomes distended, continuing to grow, to a great size. The disease even when aggravated & enormously large, does not affect the absorbents. Inflammation sometimes takes place in one of the cysts; it ulcerates, discharging serum, mucus & occasionally a little matter; the wound then heals; but it may undergo the same process.

Dissection. The breast consolidated by adhesions, containing cysts, &c.

Diagnosis. Health remaining perfect; almost entire absence of pain, except when there is a suppurative tendency in the cysts, or from the weight of the tumour pulling or stretching the nerves; swelling firm, smooth, not tender to the touch; when a fluid forms, fluctuation distinct; if it approaches the skin a bluish tinge is observed; the fluid when evacuated, transparent, with a slight yellow tinge, sometimes succeeded by a discharge of mucus.

Treatment. When large - remove it, taking care to secure the arteries as divided.
There is no danger in the operation, or no fear of a return.

When a single cyst exists, it may be opened by a lancet, putting a piece of lint in the orifice, & allow it to heal by adhesive inflammation.

Scirrhous Tubercle.
Cancer.

Frequent.

Symptoms. Generally discovered after having existed a short time, from some uneasy sensation, or by seeing the linen opposite the nipple stained by a drop of bloody serum. Sometimes a sharp pain leads to the discovery. It feels extremely hard; moveable, but more in the breast than in itself; usually distinctly circumscribed. In some instances, it is rather a scirrhous inflammation, which hardens & swells the bosom throughout. At first it is not painful, but becomes so subsequently: it is intermittent, excessively severe, generally extending to the shoulder of the same side. The pain returns about once in 10 days, but more frequently as the disease advances. A few days prior to menstruation, it feels fuller, & more painful, but is relieved after the secretion has taken place.

mine, iron, &c. Depletion with leeches. Change of climate. The patient often persists in the removal of the testis.

Operation of Castration.

Patient placed upon a table, with his legs hanging over the edge, & the hair of pubis removed, begin the incision at abdominal ring & extend it to the bottom of the scrotum. The lower part of the scrotum should be divided, or a bag of matter afterwards forms in it. Next incision upon spermatic cord, lay it bare, so as to raise it. In this 2nd incision, the ext. puden: art: bleeds & may be compressed by an assistant, until the testis is removed. Raise the cord, pass a ligature through the middle, just below the abdominal ring; the ligature is held by an assistant, which prevents the retraction of the cord. Divide the cord, draw it towards you, & dissect the testis from the scrotum.

Sometimes, from inflammation, the testicle adheres to the scrotum, in which case it is best to remove a portion of the latter, rather than make a tedious dissection. After the testicle is removed, tie the spermatic artery, & one accompanying the vas deferens; then remove the ligature which was used to prevent retraction. Any bleeding vessels of the scrotum should be tied up. Remove the coagulum from the scrotum, bring edges together by 2 sutures, apply lint, & over this a T bandage or a handkerchief.

The ligatures separate in about 8 days, & in 3 wks. the wound will probably be healed.

Diseases of the Breast.

The Hydatid a Encysted tumour.

Begins in a swelling, unattended with pain, little if any tenderness on pressure; skin undiscoloured; it incorporates itself with the surrounding parts; not as moveable, hard & circumscribed as scirrhus; general health unaltered.

Treatment. The recumbent posture for one month, or more.
2 or 3 gr. Hyd: chlor: mit: & 1 gr. Opii night & morning, untill the mouth is affected, & then preserve the tenderness of the gums 1 month. Apply leeches twice a-week, or let the patient stand up, & bleed from veins of scrotum. Apply Mist: Camp:; & vinegar, aa. Every 4th morning give an active dose of Inf: Sen:, with Sulph: Magnes:.

In about 3 weeks, you will reduce the size; & then, if the urethra be diseased, introduce daily a silver sound, to remove any obstruction, while the patient is recumbent, & living low; when at the end of 1 ms. or 5 wks. the disease will be cured.

Removal sometimes required.— When the disease has proceeded so far as to produce an abscess in the testicle.
Known by its being relieved repeatedly under the above treatment, but as often returning.

Granular swelling. Try purgative with adhesive strips; if this does not succeed, sprinkle with Pulv: Sulph: Cupri, or Nit: Argent:, which gradually reduces it. It may be removed by making an elliptical incision on each side, & then cut horizontally off. Bring edges together with suture.

When the epididymis & testicle are much diseased, & there is much loss of substance in the scrotum, it is necessary to remove the testis.

Of irritable testis.

Symptoms.— Unusually sensitive at all times; tender to pressure, or in exercise. The sensibility becomes occasionally exquisite, the patient feeling no comfort, only when at rest. The pain extends to the loins. The stomach is rendered irritable, & vomiting is sometimes produced.
The disease frequently continues for weeks, months, or years.
Treatment.— Mercury & Sarsaparilla continued a length of time, has done good; application of belladonna, opium. Blisters, &c. Iris-

True scirrhus of the testicle.

Very rare. Old persons most liable to it.

Symptoms. A slow increase of testicle; hardness, rendering it almost incompressible; occasional severe pain; surface of testicle feels knotted; the spermatic cord becomes gradually thickened; the body bent forward, & the thigh advanced; the extremity of affected side, swollen & oedematous; some water effused into tunica vaginalis; a tumour forms in the loins, but never attains the size of the medullary disease, nor does the testis become so large in scirrhus. The patient sinks from impaired digestion, violent pain in abdomen, & irregularity in state of bowels.

Dissection. Coats thickened. Instead of the tubes, a hard white mass is found in tubercles, &c. The cord also often contains tubercles.

Treatment. Extraction, if the cord be not affected. Constitutional, same as in preceding disease.

Simple Chronic Enlargement of the Testis.

Frequent. —

Symptoms. — It begins in hardness & swelling of the epididymis, at first unattended with pain. It increases till the testis becomes involved; testis quite smooth; the epididymis may be traced separately from testicle, better than naturally. It may be handled roughly without inconvenience. Both testes may become affected. It may remain in this state for weeks & months; & then under severe catarrh, exercise, or injury, &c. it becomes very painful, redness of scrotum; at length suppuration ensues, usually at the extremity of the epididymis: a sinus follows, which discharges semen. From this sinus granulations, very exuberant, spring, forming a prominent granular swelling upon scrotum.

Causes. — sympathy from a morbid state of the urethra, or an irritation; ~~from~~ of the same part; also from syphilis, &c.

the testis has often a disposition to suppurate; the scrotum becomes livid; fluctuation is perceived; ulceration begins in scrotum, & a fungous projects which discharges a large quantity of watery fluid; bleeding occasionally ensue. On pressing the testis, matter like putrid brain issues. The fungous sloughs, bleeds, again sloughs, until the patient is finally exhausted

Dissection.— A secretion of soft pulpy matter is found mixed with the seminiferous tubes, the tubes afterwards become absorbed, & the pulpy matter ~~takes~~ their place. The glands of the abdomen, &c are found to be enlarged; &c.

Diagnosis.

From hydrocele.— want of transparency; weight; globular swelling; occasional pain; yielding, rather than extensively fluctuating; want of health.

From hydatid.— When the disease becomes pulpy it is very difficult. pain at distant intervals; sallow complexion; & bad health. There is no harm to explore these diseases, with a small lancet. If it be hydrocele, the rush of water proves its nature. If it be hydatid swelling, a little water, mucous, & blood escape; & if medullary, blood only; sometimes a little brain-like substance which is sufficient.

Cause of the disease. A defective state of the constitution; irritability of body & mind, with feebleness; &c

Treatment. Medicines are of no service. The general health might be improved with calomel, tonics, &c. Locally, leeches & evaporating lotions retard the disease. When ulcerated, solutions of alum, copper, zinc, nitric, & sulphuric acids are ~~useful~~ of some use.
When the constitution is improved, or is in a good condition, & the disease not too far advanced, an operation might be performed; but it is uncertain, only performed early.

and allow no animal food for 1 week.

Of malignant diseases of the testicle.

Of the fungous, medullary, or pulpy disease of the testis.

fungous – because when it ulcerates, a fungous protects.
medullary – because it has the appearance of pultia brain.
pulpy – because of its softness – sometimes called soft cancer.

Symptoms. It begins in an enlargement of the testis, accompanied with great hardness, swelling being more globular than when healthy. The epididymis ~~even~~ becomes affected. The rapidity of the course, is various. At first there is occasional pains, not severe. Slight causes, as catarrh, exercise, increase its size; rest causes the enlargement to subside nearly to its former state. After gradually increasing to the size of a small orange, feeling hard, no tenderness on pressure, it forms adhesions with the surrounding parts; after a time the cord enlarges above abdominal ring, at length contracting adhesions to the pubis. A gland or glands become enlarged in the groin, unattended with pain after the testis has adhered to scrotum, gradually increasing. A gland generally opposite to the affected side also enlarges. The disease extends into abdomen. A cord may be felt passing up to the region of the kidney, & there forming a tumour, by pressure, when the body of the patient is recumbent.
At first the constitution is not much affected, though the skin generally looks sallow. There is, sometimes, uneasiness in the loins, shooting pricking pains in legs & thighs; & as the disease advances, the extremity of the affected side becomes edematous, & weak. Some time before death, there is a loss of appetite; little sleep; profuse perspiration; bowels generally irregular, as the tumour in the abdomen increases; sometimes there is irritability of bladder, & frequent inclination to make water.

It may terminate in a few months, ~~or not for a number~~ of years.

transparency, & its being unattended with pain, & its not running into the abdomen like hernia.

Treatment.) Incision, & sprinkle small quantity of flour in cavity. See A.C. (At the present time the seton is preferred. See Gibs. Surg.)

Hydatid or Encysted testicle. *

Generally occurs between the ages of 18 & 35 yrs.

Symptoms. — Generally unattended with pain, even when handled; the veins of spermatic cord, in some instances, are much distended, so as to be varicose; form of swelling, rounded on fore part, & flattened upon its sides; yielding under pressure, giving the sensation of squeezing the testis; the epididymis, under the greatest enlargement, can be distinguished in its swelling from the testis & a line of separation between them. It gradually increases, until & its weight, it produces uneasiness in the loins, from the stretching the spermatic nerves.

* Definition. The formation of a number of cysts or hydatids, in the substance of the testicle.

It is not malignant. It does not affect spermatic cord to the abdomen.

On dissection. Coats found to be a little thickened. Testis in the interior, filled with numerous cysts, from the size of a pin's head, to some 1in. in diameter, containing a watery fluid. The cysts are very vascular. The glandular structure of the testis seems to be in a great measure destroyed. The cysts in the epididymis are smaller.

Distinguished from Hydrocele. | By less extensive fluctuation; a heavier swelling; different shape; entire absence of transparency; division of swelling into two: epididymis & testis; &c.

Treatment. Extraction. No danger of return. (only combined with some malignant disease) Before performing the operation, you must bleed; purge briskly for a few days;

In children where the hydrocele will not give way to the aforesaid plan, use the seton in preference to injection.

Never perform the operation of incision in old persons.

Injection.) Use trocar & cannula. Fluid to be injected, is port wine & water, aa. If the port wine be old, it ~~must be more~~ need not be so dilute; 5 parts to 3 of water. Lyte of Wine 1 part, to water 15 parts, is a good material. Also the stimulating materials may be used.

When you inject the patient should be recumbent. The fluid should remain 4 or 5 minutes. If a man tells you he feels little pain, he will generally have considerable inflammation next day. Contrarily, when much pain is felt, it is generally the effect of nervous irritability, & little inflammation follows it. Nothing applied afterwards. If the patient complain of pain tell him to lie down. Let him eat as usual. Tell the patient to call next day; & if inflammation has not taken place sufficient to produce adhesion. Take the part in your hand & touch it roughly in various parts, until the patient feels a good deal of uneasiness. Then desire him to take a long walk, & afterwards a good dinner. In this way you will generally succeed.

In some constitutions having a great disposition to inflammation, the injection will act so violently as to produce suppuration. This you may ascertain by the pain & redness of scrotum, discharge the contents by a lancet, & if the opening be not too large, adhesion may still take place.

Take care in injecting not to get the cannula out of the tunica vaginalis; for if any of the fluid should escape into the cellular tissue of scrotum, inf. & gangrene is generally the result.

Hydrocele of the Spermatic cord. | Situated in tunica vaginalis between testicle & abdominal ring, sometimes extending above the ring, often mistaken for hernia. By feeling the finger around the parts, you may judge of the nature of the tumour by its blue & semi-

calomel pills, & apply locally ~~stimulating~~. stimulating lotions.

Hydrocele is sometimes cured spontaneously, by the water discharging, & adhesions taking place.

Haematocele isn't always produced by a blow. This disease is cured by letting out the blood.

Palliative treatment of Hydrocele. | Trocar & cannula. To keep the cannula in the tunica vaginalis, grasp the tumour at the posterior part, so as to keep it tense where the trocar entered. To prevent any blood from getting in the sac, &c. the patient should be in the erect position during the operation. No necessity for after application. It requires repetition generally every 6 months, but often, much oftener.

After performing this operation in old persons, make them keep their beds a few days after; as gangrene has resulted in certain cases of old men.

Treatment for Cure. 3 modes - Absorption; Adhesion; & Granulation.

Medicines have but little influence on common hydrocele, ~~when~~ when it arises from a relaxed state of the vessels. When the result of inflammation, it may be cured with absorbent medicines & stimulating lotions.

Absorption. In young persons & children a cure by this means very generally takes place. Give Hydrarg: Chlor: Mit:, & common, rhubarb, &c. so as to dispose the system to absorb. Locally liq: am: acet: ; muriate ammon: &c. Use a suspensory trusp.

adhesion - may take place from injection, seton, or incision.

Granulation. By incision & sprinkling a foreign matter in the cavity.

Caustic has been used to open the sac, but death has ensued.

Encysted hydrocele. Sometimes a fluid formed in a distinct sac, between tunica vag. testis & tunica albuginea; usually combined with common hydrocele.

When the hydrocele is very old, sometimes small cartilaginous bodies are found in the fluid.

Congenital hydrocele communicating with abdomen. | Sometimes happens. Treatment. Sir A. C. cured a case by applying a common truss, by the pressure of which the communication between the tunica vaginalis & abdomen was stopped. Worn 2 years. After the lapse of time mentioned if the communication be stopped, & the fluid not absorbed, (as it was in Sir A.C's case) the common operation may be performed.

Hydrocele may be distinguished from Hernia. | By the hernial sac occasionally returning into the abdomen; dilatation of hernia on coughing; & hernia descending from abdomen, & by hydrocele augmenting from below upwards. Hernia & hydrocele are sometimes combined, when the hydrocele is placed before the hernia. Hydrocele is sometimes met with below an adhering omental hernia. Fluctuation & transparency in Hydrocele.

From varicocele. | V. disappears in the recumbent position, absence of transparency, &c.

From diseased Testicle. | Dis. T. attended with pain & sickness; great weight & flatness; & the skin often discoloured.

From Hematocele. | Enquire into the history. Caused by violence, &c. if from violence the patient will say it soon began to swell, & the discoloration was black & blue.

Hydrocele appears to depend upon increased secretion, generally without inflammation.

Inflammation may give rise to Hydrocele; for as the inf. disappears, the hydrocele forms. Treatment — excite absorption — Give

Hydrocele.

An accumulation of water in the tunica vaginalis testis.

2 kinds: 1st, of tunica vaginalis; 2nd, spermatic cord.

Hydrocele of the tunica vaginalis. | The swelling shows at first at the lower part, & gradually rises till it arrives at the abdominal ring; pyriform shape; commonly unattended with pain, excepting only, when the result of inflammation; commonly no redness, or discoloration of scrotum.

Situation of Testicle — | Generally 1/3 way down, at posterior part.

Diagnosis. Weight of tumour, very light; the fluid is moveable under pressure; fluctuation; semi-transparency, excepting in very old cases, & in persons who had long resided in hot climates, when the tunica vaginalis is thickened, begins from the colour of skin.

Variety. | 2 swellings — 1 portion above the ring, forming a tumour there; & the 2 portion below.

Upper tumour liable to be confounded with hernia. | From situation; appearance; the upper part dilating upon coughing, the pulsation being received from the contraction of the abdominal muscles. It may be distinguished by the hydrocele being much lighter than a hernial tumour, & from its transparency.

Sometimes there will be two cavities below containing fluid; results from adhesions which might have taken place prior to, or at the time of the disease.

Sometimes the hydrocele is above the testicle, from adhesions having taken place between the testis & the lower part of scrotum.

Sometimes a hydrocelic sac formed on one side of the testicle only — from adhesions.

Tying Subclavian Artery. | The middle of the incision should be opposite to ext. jugular vein, & centre of clavicle, cut clavicular portion of sterno-cleido-mastoideus, search inner edge of scalenus anticus. Tie.

The superior scapular artery carries on circulation, when it comes off above the ligature.

Tying Brachial Artery. | If an aneurismal tumour; ie. At elbow. Tie the brachial artery at the middle of the arm. make the incision on the inner edge of the biceps muscle, taking care of the median nerve.

Aneurismal varix. | In bleeding sometimes the artery is punctured with the vein, & sometimes adhesion takes place between them; & the blood from the artery flows into the vein forming an enlargement of the vein. General acquires the size of a pigeon's egg, & then usually ceases. There is pulsation, a thrilling sensation, & a hissing sound. No harm results from it. When the accident ~~was~~ recent, it ~~[illegible]~~ may be cured by pressure applied to the brachial artery.

Ulnar Artery. | Cut on the inner side of the Flexor carpi ulnaris, taking care of ulnar nerve.

Radial Artery. | Inner side of flexor carpi radialis.

Pressure at the wrist for aneurism, a wounds of the palmar arch is dangerous, as it leads to inflammation, &c. Tie the artery at the wrist.

Carotid artery. | Cut ~~[illegible]~~ high up. Take care of par vagum.

Aneurisms of arteries of the Scalp. | Tie artery proceeding to, & from the tumour. If the sac is small, you may cut across it; & apply a doubled piece of lint, adhesive plaster, & a roller. If the swelling is not larger than a walnut you might cut off the connexion of the vessels, by making a circular incision down to occipito-frontalis tendon; applying lint, & adhesive strips.

Aneurism of the anterior & posterior tibial arteries. When situated at the upper part, the same operation is employed as that for popliteal aneurism.

When situated near the fork. – Must cut down on the sac, and apply a ligature both above & below it.

Aneurism between the groin & the middle of the thigh. – Tie the external iliac. Cut above the abdominal ring, in a crescentic shape to the edge of Poupart's ligament, & continue it to 1½ in. from inner side of spine of ilium. Divide the tendon of ext. oblique. Raise the other 2 broad muscles from Poupart's ligament with the finger introduced behind them; elevate the spermatic cord, carry the finger behind peritoneum, & you feel the beating of the artery. Introduce the aneurismal needle under the vessel & tie the artery; if it be too much separated (1½ in.) 2 ligatures must be applied 1½ in. distant from each other, then divide. If the ligatures be put nearer each other, on dividing the artery might retract & hemorrhage may take place, & the ligature slipping off. The vein is on the pubic side of the artery, in the same sheath; the nerve is on the outside of the sheath. The epigastric artery lies just inside the incision. Bring the edges of wound together with adhesive plaster, & the ligatures come away by ulceration. The circulation is principally carried on by the gluteal artery; also ischiatic, obturator, &c.

Aneurism of Gluteal artery, just at commencement. Must tie the internal iliac.

Make an incision on the inner side of spine of ilium, cut through muscles, turn the peritoneum to the opposite side; separate the ureter from the artery, & put the ligature around it.

Tying the aorta. – See Cooper, Sir Astley.

Aneurism of the Carotid – An incision 2 in. long, inner side of ster. Cleid. mast. muscle, from inferior part turnwards to the clavicle.

Spontaneous cure. Sometimes follows, by the obliteration of the artery.

Treatment.- If the pulse be hard & full, a little bleeding may do good. Soda, & entire rest, seem to prevent the increase of the swelling; but the soda at last must be stopped, on account of its producing petechiae. The antiphlogistic treatment does more injury than good, by increasing irritability, consequently quickness of pulse.

Popliteal Aneurism. The femoral artery should be tied one third way down the thigh. The incision to be made on the inner edge of the sartorius, 4 in. long. Separate the artery ½ in. & apply a ligature. If you separate more, 2 ligatures will be necessary.

In aneurisms attention must be paid to regimen; & must avoid all stimuli.

Use fine ligatures; make a tight knot; cut one end off, & let the other hang out of the wound. If you separate the artery from the cellular tissue, for an inch or so, apply 2 ligatures, & divide the artery in the centre; but if the artery has not been disturbed much apply 1 ligature. Bring the integuments together with adhesive plaster, with spaces between each piece. No bandage of any kind.

Position of the leg.- The limb should be placed on a pillow on its outer side. The position should be changed frequently. If he rest on the heel gangrene may result, &c.

The patient should be kept in a warm room, as, cold may dispose to gangrene. In cold weather wrap the limb with flannel, or put on a stocking.

When the femoral artery is tied, circulation is carried on by the profound artery.

Ligatures separate generally from the 12th to the 14th day; not less, often may more days. When the ligature comes away do not think the patient safe from hemorrhage, make him remain in bed 2 or 3 days afterwards.

Aneurisms of the aorta, proceeding above the clavicle, have been, & are liable, to be mistaken for aneurism of the carotid, or subclavian. Hence, be cautious.

Aneurism of the abdominal aorta. | When situated above the ~~seat~~ coeliac artery, pulsation may be felt at the ensiferous cartilage; the pressure of the sac upon the stomach produces nausea & vomiting, & small quantities of food are immediately rejected.

Aneurism in the loins. | Liable to be confounded with lumbar abscess, as, there is no pulsation in the aneurismal tumor.

Aneurisms appearing at the ischiatic notch. | May be taken for the tumors about the nates.

In such cases the symptoms vary; the digestive organs being in fault, the urinary at another, &c.

Aneurisms generally occur between the ages of 30 & 50.

Causes. — Generally inordinate exercise, &c.

Most common in males.

Formation. The artery becomes opaque, & slightly inflamed. A yellow spot appears, &c. Absorption takes place, the coat becomes thin; Nature throws out on the outside adhesive matter, as a defence. Sometimes a dilitation of the coats forms the aneurism.

Cause. A diseased state of the coats. Sometimes results from the bursting of an artery, under considerable expection. Sometimes from a puncture.

Diagnosis. — When recent, if you press upon the artery which leads to the aneurism, you will empty the sac; but if the aneurism be of longer duration, & the pulsation slight, if you press your finger upon the artery above, you will see the aneurism sink down if you observe it carefully, though the sac will not entirely empty itself; upon raising the hand suddenly, you will observe a jet of blood rush into the sac.

Aneurism.

A pulsating tumour containing blood, & communicating with the interior of an artery. Exception – Aneurism of heart.

When externally to the body. | 3 stages. – 1 early stage. – Small tumour pulsating very strongly. The force of pulsation is in the inverse proportion to the size of aneurism. When first formed it only contains fluid; & the sac may be easily emptied by pressing on it. Scarcely any pain, or other alteration in the limb excepting irregular circulation, producing spasm; & when the patient goes to bed he has cramps, & sudden twitchings in the part.

2. Stage – The blood begins to coagulate in the sac, the coats of which are much thickened. Symptoms. – Sac can only be partly emptied by pressure; some pain in the part, in consequence of the size & pressure. The circulation is retarded by pressure on surrounding parts.

3 Stage –. Tumour large, pulsation greatly diminished. The pulsation is generally seen in the part opposite to the opening from the artery, & seldom over the whole tumour. If it be behind a joint the motion becomes impeded. The part becomes swollen; the aneurism becomes dark coloured; inflammation, & vesication of the skin covering the sac ensues, to the size of a half crown, the skin in this part is insensible. In a few days an eschar forms, the sac opens; frequent bleedings take place, which results in death. The sac does not burst suddenly so that the patient is destroyed by the gush, but by repeated bleedings. But sometimes the sac does burst suddenly.

Aneurism of the Heart. | A bag formed out of the parietes.

Do not operate for aneurism till you have ascertained whether there be one situated in any other part.

If an eschar forms externally from aneurism of the arch of the aorta, you may prolong life a few days, by applying lint, over this adhesive plaster, then a bandage. | Sir A. C. preserved the life of a patient 27 days in this way.

only be made when necessity is very imperious.

Injuries of the Spine.

Concussion.| Paralysis of the parts below the injury, &c. * involuntary discharge of fæces, retention of urine, &c.

Treatment.— Cups to the part. If the paralysis remains after a week or 10 days, apply a blister, & dress it with equal parts Ung. Lytta, & ung. Saline.

Extravasation.| — Results fatal — when considerable. Might Bleed at first, to prevent further extravasation; & afterwards promote absorbtion, & excite counter-irritation.

Fractures of Vertebræ.

With displacement.— Paralysis in parts below the injury. * When situated in the dorsal vertebræ, a great secretion of air results, in the abdomen.

~~Dislocation~~. Without displacement.— Rare occurence.

Dislocation can only take place in the cervical vertebræ, the direction being either forward or backward.

In a depression of the arch of a vertebræ, trephining has been performed to elevate it. The cases, though not completely successful, lengthen ~~and~~ the patients life a short time.

Suppuration & ulceration of the Spinal marrow. } — Rare occurrence.
— Symptoms — Pain in back; paralysis; * &c.
Prognosis — Fatal.
Treatment.— When upon would expect such a state to come on; use cups, leeches to prevent inflammation; subsequently, counter irritants, &c.

Time at which inflammation occurs. | After the injury, is generally about 1 week: rarely under that time, but often a longer time: so that you cannot consider your patient safe till after 3 weeks. This inflammation is slower coming on, than that of any other organ.

Treatment. In adults bleed from the temporal artery; & the jugular vein ~~for~~ young patients. In adults, if the symptoms are not relieved after bleeding from the temporal artery you may try the jugular vein. Give cathartics, & diaphoretics. Locally apply blisters to the head.

If a depression exists after a wound of the head heals up; the person must not indulge in intemperance & ~~[illegible]~~ high living; as violent headache results, &c. Relieved by bleeding.

— " —

When it is necessary to Trephine.

1. Extravasation of blood between dura mater & skull.

2. In fractures of the skull with symptoms of compression after depletion.

3. In simple fractures, with depression, accompanied with symptoms of compression.

The Trephine should not be applied over the course of any of the sinuses, or over the course of the trunks of the meningeal arteries.

In a fracture with depression; the depression may often be raised without the aid of the trephine, merely using the elevator.

After the scalp is returned over the opening; apply a poultice.

Wounds of the Scalp.

Danger of Erysipelas & its results; and inflammation of the occipito-frontalis tendon.

Be cautious in making incisions to explore wounds. They should

On Wounds of the Brain.

Are not followed by any ~~[illegible]~~ interruption to the operations of either mind or body, unless the wound be accompanied with concussion, or compression. Sometimes epileptic fits & hemiplegia result.

If a portion of brain be lost, & a piece of the cranium occupies its place, very often, no symptoms of compression arise; & if no such symptoms result, you must not elevate the bone.

When the brain is wounded, bleed largely, but not to such an extent as to prevent the restorative process.

Hernia often sprouts out. — Treatment. — Apply lint, moistened with liquor calcis, & over this adhesive plaster. Next day apply a thicker piece of lint as at first, & so continue till it is even with the edges of the dura mater, when it must be cautiously preserved, till the dura mater heals over it.

The mind & body should be kept quiet.

Inflammation following wounds of Brain.

Symptoms. — Patient complains of great pain; soon becomes comatose, & when roused the pain is excessive, (the patient giving rational answers); scalp around external wounds oedematous; discharge from wound of a fluid composed of blood & serum; countenance flushed; carotids beat with great force, & may be seen some distance from the patient. The next the patient is seized with rigors, in quick succession; often hemiplegia.

If the inflammation terminate in suppuration, the matter is generally found between the pia mater & brain, it is also found in the other places, before mentioned. You ~~[illegible]~~ might operate if you knew the matter was between the dura mater & the skull, but not otherwise.

If the membranes of the brain are attacked with <u>inflammation, violent</u>, symptoms of irritation will be present; but if the brain itself, they will be those of compression.

Compression from Extravasation. | Symptoms do not directly occur; the person at the time is stunned; recovers himself, & some time after he falls into a comatose state, & then the apoplectic stertor begins.

Extravasation with concussion. The symptoms of concussion, comes on first, & the stertor & then symptoms of compression succeed.

Extravasation takes place, 1. between the dura, & pia mater; 2. between the pia mater & brain; 3. in the brain itself.

Treatment – Little can be done. If the extravasation occurs with fracture, trephining may be of use. Deplete to prevent inflammation. Keep the patient quiet, & his bowels open. You must trephine only before the excitement, or it will be fatal; for when the excitement takes place you can only deplete.

Fractures of Skull. ~~A~~ crack not dangerous. They unite slowly.

Treatment.– Bring parts together in compound fracture, with adhesive plaster. Constitutionally – bleed & purge.

Fracture with Depression. | The symptoms of compression come on directly.

Apparent depression. From a mere depression of the integuments, or the external table driven into the diploe. Therefore caution is necessary. Many cases where there was a supposed depression recovered after 2 or 3 days, after being freely bled & purged. If there are no symptomes of compression, do not trephine, & if there are symptoms of injury to the brain & the fracture is simple, bleed first, before you trephine.

In compound fracture with depression (having the symptoms of compression) use the elevator if possible without the trephine, if the bone has been comminuted remove the ~~[illegible]~~ fragments; however if the bones are wedged use the trephine. It is no use to do anything of this kind after inflammation has taken place, for the patient will die.

Sometimes epileptic symptoms attend a small spicula of bone projecting into the brain, for years after the accident. They may be removed by trephining & extracting the spicula.

Sometimes ~~a~~ loss of sensation & volition attend a depression for years after the accident. Trephine & elevate.

Slight concussion — merely an agitation of brain, altering circulation.
Severe — Brain lacerated — blood extravasated. — } On Depression

Treatment. — Bleeding —. Should not bleed immediately after the accident; for if the pulse ~~be full~~ can scarcely be felt; but after reaction takes place then bleed, the pulse being the guide for when hard you must bleed but not otherwise. The 1st bleeding may be copious, but the others must be small if you bleed, because if you reduce the patient too much, the reparation powers cannot go on. If there is no extravasation, or tending to apoplexy emetics are useful, cautiously used, & relieving the stomach of its contents, as the accident generally happens to intoxicated persons; & also determining the blood to the head, restoring the patients senses a short time. ~~Give purgatives of calomel, followed by~~ Do not give them till 3 or 4 hrs. after the accident to see if the symptoms of compression from extravasated blood ensue, &c.

Give calomel purges 2 hrs. after accident, follow by infusion of senna or Sulph: Magnes: / & fluids to drink, which if gently stimulant will act as counter irritants. Antimonial diaphoretics are good. Counter irritants are good, as blisters, after other means.
Trephining for concussion has been entirely abandoned, as it was generally fatal.

Treatment of Children. As you cannot always bleed from arm, give calomel with some mild drink to purge; apply leeches to temples; open jugular vein.
Symptoms after concussion —, as pain in head, sickness at stomach, &c. ~~and~~ make issues in the scalp; wash the head with Spts. Rosm. et aqua; & use shower bath. Sometimes, Ung. Lytta; Pil: Hydr: ; and Ext: Col: comp:. Electricity, &c. In long continued pain, an issue even to produce slight exfoliation has proved useful.

Compression

Symptoms. — Breathing stertorous; pulse slow; pupils dilated; & added the symptoms of concussion.

Causes — 1. Extravasation of blood. 2 Fracture with depression. 3. Formation of matter in the skull.

stimuli. Locally use lotions in the first stages. When the vesicles break, the part may be powdered with starch. If gangrene is even produced, use port wine poultice, nitric acid in water, &c. ʒi to ℥ij.

Injuries of the Head.

When the brain receives an injury, there is a general loss of sensation & volition; but if not very severe, some portion of both remain. The patient is generally found comatose. If you rouse him, he mumbles a brief answer & again relapses. Liable to be confounded with intoxication.

Effect on abdominal viscera. – The faeces pass off, in consequence of the paralysis of the sphincter ani. The voluntary power of the bladder is paralyzed, so that you must draw off the urine with a catheter. Torpor of the bowels. Often vomiting. Pulse slow when the body is at rest, becomes very quick on a slight exertion. Often hemiplegia, squinting; bleeding from the ears generally attends fracture extending to the base of the skull, such a case is generally fatal.

Concussion. – A shock of the brain, attended with or without lesion. When called to a person – in a state of stupefaction, but not to a great degree; regular pulse, tranquil & regular breathing; & the accident has existed some hours, you may say the injury is slight: but when he has been first seized with vomiting, lost muscular power, mental faculties aberrated, intermittent pulse & breathing, the case may be considered dangerous. Where the derangement is not extensive, & the patient can be roused, & some power of volition left, the pulse will be found the best diagnostic symptom. At rest it may be 70: but if raised, or any exertion be made it will beat 120 in a minute, or more. –

Pathognomonic Symptoms of Concussion. | Increased motion of carotids; apparent tranquil sleep; the instantaneous relapse, after rousing, & insensibility immediately after injury.

Hearing is sometimes totally lost; as is also the memory.

In slight concussion, a change in the circulation merely, is produced. The powers of the mind soon resume her empire in such a case.

When the gangrene results from defective action or accident. | As from accident or pressure on some important vessel, as in aneurisms, amputation may be performed without any hesitation.

On Gangrene in Old Persons.

From weakness of circulation; ossification; &c. especially in tall persons. Generally attacks the toes first; — 1st red & painful; in a few days cuticle comes off, sanious discharge; red streaks creeping up the leg; glands of groin inflame & enlarge; the whole member becomes red, from inflammation of the absorbents. It will not commonly destroy life, if attention be paid to the patient.

Treatment. — Locally — poultice of port wine & oat meal is the best remedy. Internally — combination of opium & ammonia. The cases do not always recover. Never amputate.

Carbuncle.

Symptoms. Pain; swelling; livid redness; numerous small ulcers making it sieve-like; white discharge. When the small openings are formed into one the dead cellular tissue escapes.

Prognosis. — They usually do well, except when on the head or neck, when they are often fatal.

Treatment. Make a crucial incision early; then apply a port wine poultice. Give opium & ammonia.

Erysipelas.

Symptoms. Sometimes — chill & fever. Characteristics — florid skin; vesicles containing serum. Sometimes it terminates in gangrene. Other inflammations of the skin are often taken for it. The ~~[illegible]~~ vesicles is the best sign.

Treatment. — Calomel to restore secretions. Generous diet; quinine, & other tonics. Intemperate persons must have their

History of Gangrene.] The excessive action of the part closes the blood vessels, & the blood contained in them becomes coagulated. A part cannot even be recovered again, because living blood cannot circulate through them.

Treatment.] To prevent gangrene where the action is excessive, by soothing methods. — Use leeches to check the action. The body will not bear any degree of depletion. Apply poppy fomentations & poppy poultices. Constitutional. — If the patient be stout, plethoric, & temperate; a few ounces of blood may be taken. 2 or 3 gr. of calomel, at night, to restore defective secretions; through the day liq: Ammon: acet:; with a few drops tinc: Opii; to diminish irritability & tranquilize the system.

When from the application of cold. — Use very gentle stimulants. The best application is Spt: Camp: gently rubbed on the part. After the first effects of cold are removed, apply cold poultices.

When Gangrene has commenced.] Apply a gentle stimulus to the parts, with a view of supporting the action of the surrounding parts, which are threatened. A poultice of stale beer grounds is good. Spirituous fomentations are useful. Constitutionally — give Carb: ammon: gr 7 to 10; Tinc: Opii gtt 20 to ʒj, 2 or 3 times a day, or oftener. Bark is not useful. (Quinine recommended.) Ammon: S. & musk, gr. 10. A port wine poultice is good. Turpentine is often employed. During separation the following is a good lotion. ℞ Confec. Ros. ʒj, Mel. Ros. } aa, Tinct. Opii } aa, Liq. Plumb. Subacet. ʒjj m

The nitric acid — gtt 50; to aquæ ℥j is the best application during sloughing. Camphor & vinegar good.

Propriety of Amputation.] No occasion in general, when nature is performing the operation. Should only operate where the patient's constitution will not bear that of nature.

Never operate in constitutional gangrene till the sloughing has commenced, & healthy granulations are to be seen on the sore; for if you operate, the parts will assume the same appearance as before. A small quantity of blood lost often causes death in such cases.

When the result of high inflammation. – There is usually a blush to a considerable extent, often swelling. The secretions from sores, if any exist, & the skin cease. The surface becomes dark-coloured; the cuticle is raised when it breaks, it is found to contain a bloody serum. The skin becomes insensible. Then gangrene. The vesication extends to parts beyond the ulceration.

Constitutional symptoms. | High irritative fever. Pulse generally quick, small & thready & generally irregular. Delirium almost always. Vomiting; hiccough, which is the characteristic sign of gangrene, no matter where situated. Any slight stimulus given internally, as cold water, suspends hiccough for some time.

Gangrene from feeble action. | If from cold, the part becomes benumbed.

Separation. | A white line first perceived ~~between the~~ where nature & intends to throw off the dead part. At the line the cuticle is raised. The living matter in contact with the dead, is absorbed, & consequently the skin separates; then the cellular tissue, which having much less vitality separates higher up than the skin. It is for this reason slouching sores extending to the cellular tissue are dangerous. The muscles separate nearly opposite the edge of the skin. The tendons like the cellular tissue separate farther up. The nerves separate in the same line with the muscles, &c. The blood in the vessels (arteries & veins) of the dead part coagulate. The coagulum extends up the living vessels, sealing them; when they separate. The separation of the bones, is very slow. Hence they are often aided by the saw, &c.

Gangrene, effect of debility. | Persons long confined. The parts are apt to slough, as the nates, &c. From imperfect circulation. Some fevers have a great tendency to produce gangrene, ~~&c~~ in scarlatina the tonsils sometimes slough, &c. Measles are apt to be followed by it, unless great care be taken not to irritate the chest.

A tendinous structure when attacked by inflammation, often runs into gangrene, in consequence of the little vitality of the part.

Varicose Ulcer.

Treatment. Recumbent position. Lint wetted with the mercurial wash applied; over this - oiled silk, & then the limb, beginning at the foot, should be regularly bandaged. The bandage allows the veins to recover lost action.

Puncturing of the veins ~~[illegible]~~ twice a-week, is very good; the bandage afterwards applied, & the parts kept wet by some evaporating lotion. If the punctures do not heal, apply the black wash. "Never tie the veins!"

Carbuncle Ulcer.

~~Carbuncle~~ — Aperients, & alteratives. When there is great debility give Carb: Ammon:. This remedy improves the nervous system decidedly. Locally poultices, black wash, or gently touch the surface with nit: argen:; to excite granulation.

Ulceration of the Skin, without evident cause. Treatment — the yellow wash, ung: hydr: nit:, or ung: Zinc: Oxy:. Internally, mercury, & bark.

Noli me tangere:— An ulceration of the follicles of the nose; it may destroy the cartilages. Treatment — Locally — a good ointment, is, ℞ Arsenic Oxyd:, Sulph: Flor:, ana ℥j, Unguent. Cetacei. ℥j. Spread on lint, & applied 24 hrs,; then remove it; a slough will come away: dress with ung: Simp:. If the ulcer is not deep it may be cured by merely painting the surface with nit. arg.

Thickened edges of ulcers.— removed by the empl: galle: comp:, or ung: hyd: fort:, or ung. lytta, or scarifying.

Inverted edges.— Treat constitutionally. Apply to the edges nit. argent:, & black wash to the surface.

Everted edges.— commonly symptomatic of a cancerous diathesis. Poultices, & approximate edges.

Gangrene.

may arise from two great causes, or from debility.

Intemperate persons must use their stimuli.

Irritable Ulcer. — Granulations very unequal, discharging a bloody pus; very painful & tender. The best application is the following:

℞ Ung. Cetacei
Hydrarg. Nit. — aa — ℥ss.
Opii Pulv. — — ℥j. Misce.

Spread on lint, apply twice a-day. Internally calomel & opium is very good. Cal. gr v; Opii gr i; night & morning; excellent in bites. Syrup Sars. comp. Barbadoes Naptha recommended as a dressing.

Sinuous Ulcers. — When a channel is formed. Treatment. — To excite adhesive inflammation, an injection of tinct. Lytta. The caustic bougie is sometimes used.

Ulcers caused by nails. — If scraping the nail thin, & putting lint under the place will not do, a blister is a good application: this often removes the nail with the cuticle. If the above will not do, operate on the diseased side of the nail.

— A disease in the gland producing the nail, causes it to turn black. Treatment — Wash with black wash, & administer mercury & Sarsaparilla. The affection is not syphilitic.

Whitlow — should be poulticed, & then opened.

Menstrual Ulcer. — In females. — Treatment — black wash internally, as an emmenagogue, give Iron, & Myrrh, several times a-day; every night 5 gr. Pil: Calomel Comp: (Plummer's pills) to restore the secretions.

Varicose Ulcer. — Causes. — Generally, thickening or rupture of the valves causes them to become varicose, & their being incapable of approximating. By the powerful attempts of the arteries to return the blood to the part, inflammation, & ulceration are soon excited. The whole surface covering the diseased veins is formed into a crust, under which a quantity of serum is secreted. — Treatment. —

When the granulations are too profuse (vulgarly, proud flesh.) dry lint may be applied in the centre, & some unctuous substance to the edges. The presence of the lint, prevents the growth of the granulations in the centre, while the unctuous substance allows the granulations to inosculate with those on the surface.

Nitrate of silver, & sulph. cupri, are employed to destroy luxuriant granulations near the edges of the sore.

Sir A. C. says, Adhesive plaster is too stimulating to keep them down; a better plaster, is one, composed of equal parts emp. thuris comp., & emp. saponis. Sometimes when too luxuriant it is requisite to apply lint covered with simple cerate, over this a piece of sheet lead, & then a roller.

Languid granulations — A good stimulating application is the ~~Ung.~~ Ung. Hydrarg. nit-oxid. The whitened edge of the sore arising from the thickened state of the cuticle cured by the last remedy. It may be remedied with the ung. hydr. fort. Lotions of zinc, copper, corrosive sublimate & lime water, are also used. The patient should take a good deal of exercise. The Empl. galb. comp. is a good stimulating plaster. Good diet.

Inflamed Ulcers. — Serous discharge, bloody ichor, — often a disposition to slough, inactive, & surrounding parts inflamed.

Treatment — Rest; Fomentations, & poultices. Purged with Cpt. Col. comp. & calomel, followed next morning by an aperient. Leeches if much inflamed.

Sanguinous Ulcers. — Free from discharge; edges livid, with vesicles upon them; patient suffering from irritative fever:

Treatment — Perfect rest. If the action in the part is excessive, it must be soothed; if it be weak, a slight stimulus should be employed. The best stimulus is, Nitric acid gtt. 50. to aqua ℥j. Oiled silk should be applied, to prevent the smell from filling the room. Nitre is also good. Poultices of port wine, porter, yeast, &c. are all very good. Ballot poultice. Internally opium & ammonia. Nutritious diet.

Granulations.

Newly formed part, generally florid, & secreting pus.

Recent granulations are not good absorbent surfaces in ulcers, but old granulations have the power of absorption.

Opium may be usefully applied to ones in cases of tetanus.

Granulations arising from parts naturally sensitive, are also sensitive; but those springing from parts naturally void of sensation are also non-sensitive.

Granulations readily unite; therefore, it is useful to apply pressure to bring them together.

A circular one requires more time to heal than one which is longer but is of less diameter

The contraction of the skin which oftenes takes place after burns have been healed, may be prevented if the wound is healed up slowly. Warm poultices should be first applied untile the slough come away, then astringents or escharotics may be employed to stimulate. Nature approximate distant parts, because the cicatrization is to much hurried, forming an unnatural union.

When a muscle is cut, it is not reproduced with muscular fibre, but with tendinous matter. The cartilages of the ribs in adult life when severed unite & bone.

On Ulcers.

In a healthy ulcer, a poultice, not too warm, is the best application to promote granulation. When they rise to the edge of the skin, they should be pressed down equally with the surface with unctuous substances.

Treatment in acute abscesses. Diminish excitement & irritation. A good medicine is lig. Ammon. Acet.; Sulph. Mag.; & Opium. Locally poultices, & the part enveloped with oiled silk.

When matter is close to a bone, it may be let out, excepting in cases when it may occur from severe causes of mercury, between the cranium & pericranium. If a fluid exist unattended with a blush, do not open it; it will be removed by purging & sarsaparilla. But if there is a blush, it will not be absorbed; an opening may be made.

Treatment of Chronic abscesses. A good nutritious diet, ammonia, bark, &c. Locally stimulant poultices, the best is a solution of salt, in a common poultice. In indolent cases stimulating plasters.

Chronic abscesses under the fascia lata should be let out, & a roller should be then applied around the limb, excepting at the opening. The same directions under any tendinous membrane.

Care should be taken to prevent scars on exposed parts. Aperients, calomel should be used, with a strict diet. A small opening should be made; & the incisions should be transversely made. In strophulous tumours, the solid flakes should be all squeezed out. Afterwards a poultice with a lotion of Sulph. Zinc may be used, but not warm poultices.

If a tumour have a blush like the hue of the grape; do not open it; the veins are dilated.

If the edges of a wound should not unite readily, a little solution of Sulph. Zinc or Cupri ~~should~~ may be applied.

Sir A. C. says the admittance of air into cavities has no influence in irritating them. The cause of irritation is the division of the nerves in the part cut to open the cavity; & its degree depends upon the ease or difficulty with which the injury is repaired.

Healthy pus is not irritant. When pus is putrid it is a bad symptom generally; but in some cases it is merely caused by a piece of diseased bone.

Pus keeps the granulations moist; it effects the escape of foreign matters, &c.

Caution is necessary in stopping long continued discharges. The unfavorable symptoms which often arise from stopping them, may be prevented by attending to the secretions. Give calomel at night & an aperient in the morning.

Ulceration.

Or absorption of any part, being inordinate.

Cause — Inflammation with pressure. Formation of matter not necessary. Ulceration has a tendency to the external surface.

Newly formed parts, are more liable to ulceration than those of long existence.

The parts most remote from the heart ulcerate most readily.

Ulceration removes extraneous substances, &c.

Abscesses.

Produced by inflammation, without loss of substance.

~~Abscess~~ The danger attending abscesses, arises from their size, number & seat, or from pressure upon important parts.

Acute abscess — course about 3 weeks.

Chronic abscess much longer. If a patient has a swelling in the groin, rebounding under the hand upon coughing, fluctuating feel, & pain in the loins for 4 or 5 months, you may say it is psoas abscess.

Chronic abscess sometimes occur in the female breast, & are often taken for other tumours, &c.

Sir A. C. recommends lint dipped in blood to be applied over cases of compound fractures when you wish to produce adhesive inflammation.

Ligatures should be small & consist of fine silk, excepting in case of ossification.

Coagula of blood should be removed from a wound, as they interfere with adhesion.

One end of the ligature should be cut off close to the knot.

In amputation the other ends of the ligatures should hang out seperately in the most depending portion.

If the amputation be above the knee or elbow, a roller should be applied around the stump to prevent retraction of the muscles & extensive suppuration.

The stump should not be dressed the 1st time for 6 or 8 days.

A wound ~~[illegible]~~ communicating with a joint should be closed with fine ligatures.

Suppuration.

Formation of matter from the secreting orifices of the blood vessels.
It is a secretion.
Pus formed generally in from 7 to 14 days.

The reason serous membranes do not generally suppurate, is, because the vessels are too small to permit the passing of the particles which pus contains; but if the inflammation becomes violent or long continued, the vessels dilate, & purulent matter forms.

In wounds of the thecæ a aponeurotic sheath; if suppuration result, the matter should be let out instantly, no matter how small the quantity.

patient on his back, & applying a little cold water, it will stop immediately.

Counter-irritation in Inflammation.

Local treatment of chronic Inflammation.— In long continued discharges from relaxation stimulating lotions are employed. In sluggish, indolent ulcers stimulating washes are employed.

In applying stimulating lotions to indolent ulcers, you should cover them with oiled silk, to prevent evaporation. You wish to obtain heat & action here.

Counter-irritation.— Blisters, sinapisms, ~~if sweat sections~~, &c. used. Should not carry it to an excess.

Position.— The recumbent useful to drain parts, especially if the parts be elevated.

Rest.— Necessary in inflammation.

Indurations which frequently remain after inflammation may be got rid of by diminishing the circulation of the part, & producing absorption.

Pressure excites the absorbents.
Electricity has the same effect.
Mercury does the same.
Friction may also be used.

Adhesive Inflammation.

Serous membranes are liable to adhesive; & mucous membranes to the suppurative inflammation.
The time required for adhesion depends on the part, & state of the constitution.

the pulse be hard. The indication of a repetition is a hard pulse.

When you bleed to relieve inflammation, make a large orifice so as to abstract it as rapidly as possible. The grand object, is to produce fainting. The patient must must be standing.

In chronic cases care is necessary in bleeding. It is best to use local instead of general depletion.

To restore the secretions in inflammations purgatives, &c. should be used. Purgatives are counter irritants, & irritating the intestines.

Inflammation is sometimes subdued & producing nausea.

Treatment of Chronic Inflammation. You should restore the secretions. Calomel & opium is a good remedy. Another good one is the oxymuriate of mercury & syrup of Sarsaparilla. The same preparation of mercury with bark is good in cases of children. Iron & rhubarb may be given to infants.

Local treatment of Inflammation. Cold relieves inflammation, & lessening the diameter of the vessels, the heat, the action of the part, through lessening its nervous irritability.

Spts. Wine ℥j water ℥v - is one of the best lotions. By the evaporation produced, the heat is abstracted, &c.
Ice in high inflammation irritates, & is apt to produce gangrene.

Heat & moisture joined together relax the skin & give rise to perspiration, thereby removing congestion. Poultices & fomentations, thus useful.
Leeches lessen pain & tension; the bleeding may be encouraged by bathing with warm water, (after the leeches drop off) & wiping with a warm sponge.

In some situations leeches are inconvenient, as on the scrotum; the small veins ~~may be punctured with a lancet~~ on front of scrotum may be punctured with a lancet, while the patient is standing; with a little warm water any quantity may be abstracted; It is easily stopped; for, placing the

Serous membranes when inflamed are disposed to pass into the adhesive inflammation; whilst the mucous membrane, generally go on to the suppuration stage.

In acute inflammation as a general rule you bleed generally & locally, ~~[illegible]~~ you should use soothing applications, as narcotic & emollient fomentations. When the acute ends & the chronic begins you stimulate the vessels to contraction, & thus restore them. Affected by astringent & stimulating lotions.

Specific Inflammation 2 kinds, viz., 1st produced by a peculiar condition of the system, as gout, the formation of scirrhus, scrofula, &c. 2nd produced by poisons, as gonorrhoea, matter of small pox, &c.

Irritable Inflammation. Nerves more affected than the blood vessels. Patients complain of pain in some particular part. The eyes are very subject to this disorder. But the part most attacked are the female mammæ. To cure these severe pains, medicines must be given as will influence the secretions, in the latter more particularly the uterus. It frequently attacks the testes. The bladder is also subject, & the symptoms resemble in many respects those of stone. The great difference is: the irritable bladder is most painful when the organ is full; the bladder ~~and~~ that contains a stone, when empty.

Irritable persons are more predisposed to inflammation than others, & is more dangerous in them. Mercury, by rendering the body irritable disposes to inflammation, therefore it is wrong to operate immediately after a mercurial course.

Proximate causes of Inflammation.— An increase of ~~the~~ action in the vessels of the part, & also an increase in the size of the vessels themselves.

Treatment.

Blood letting most powerful means. It produces a diminution of nervous power; lessens the momentum by decreasing the quantity of blood; it promotes the secreting functions.

The great indication of bleeding is a "hard" pulse. never bleed unless

power is greater; in old age, irritability is much diminished, but the powers of restoration are much less.

Treatment.

When depending on a local cause, the remedies must chiefly be directed to the removal of the cause.

Constitutional irritation must not be too suddenly subdued, as a certain degree ~~[illegible]~~ shows that nature is endeavouring to accomplish the restoration process; it should be kept within bounds, & carefully watched.

Irritation may be reduced by relaxing the secretions & allaying the nervous excitement. The first with aperient, calomel, antimony, &c.; the other with opium, calomel, &c.

Common Inflammation. Inflammation.

Is the means by which local injuries are repaired. There are 4 signs, viz., redness, swelling, heat, pain.

1. Redness – Small vessels carrying red globules, &c.
2. Swelling – Effusion. Increased determination of blood, &c.
3. Heat – From the increased circulation, &c.
4. Pain – By distension of nerves from great quantity of blood, &c.

Inflammation has 4 terminations.

1st Adhesion – From fibrin being effused by which the parts become glued.

2nd Suppuration – Composed of particles similar to blood, only differ in colour.

3rd Absorption or Ulceration – Increased action of the absorbents, produced by purpose united with inflammation.

4th Gangrene, Death of inflamed part. The arteries being enfeebled by excessive action, are deprived of vitality, the blood coagulates in them, & gangrene results.

Notes from the "Principles & Practice of Surgery", by Sir Astley Cooper.

5.19.42

Irritation.

Among the sympathetic actions is one which is the result of injury and disease, on one hand becoming the cause of restoration, on the other of destruction; this state of the body is called irritation.

Irritation may be defined to be an altered action, excited in the system by an unnatural impression.

Irritation is generally communicated through the medium of the nerves

Irritation is either local or constitutional.
Local affecting only particular parts, as a decayed tooth producing an abscess. Cured by removing the cause.
Constitutional when the constitution is affected from some local cause.

When any part of the body receives an injury, the nerves convey the impression to all the important organs of the body, spinal marrow, heart, stomach, &c. Nature immediately commences the restorative process, by stopping the secretions; the blood consequently collects in the heart, &c. which propel the blood with increased force to the wounded part; thus giving rise to inflammation, the best restorative process. If the inflammation is too great we should bleed, restore the secretions, legislent if we lower the action too much the restorative process will be prevented.

The degree of constitutional irritation, depends on the part injured, the extent, nature, age of patient, habits, &c.

In infancy the irritability is exceedingly, & the system easily excited to destruction: after 2 years it is considerable, but the restorative

Nurses call congenital hernia, wind rupture, in contra-
distinction to hydrocele, which they call, water rupture.

Sir Astley Cooper.
Geo. R. Wood M.D.